YUKON RIVER SALMON SEASON REVIEW FOR 1997 AND TECHNICAL COMMITTEE REPORT

Prepared by

THE UNITED STATES/CANADA
YUKON RIVER JOINT TECHNICAL COMMITTEE

5-6 November, 1997

Whitehorse, Yukon Territory

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1.0 INTRODUCTION

The fall meeting of the Yukon River Joint Technical Committee (JTC) was held in Whitehorse on 5-6 November, 1997. The agenda for the JTC meeting was to: 1) prepare the standard post-season summary report for the 1997 season and review stock status for the information of the Yukon River Panel; 2) discuss the Restoration and Enhancement Fund (R&E) proposal and report review procedures for the 1997-1998 review cycle; 3) compile the available information on salmon coded wire tag (CWT) releases and recoveries in the Yukon River drainage, and discuss sampling programs, and 4) other business. This report summarizes the work of the JTC on these items. A salmon stock identification discussion paper, requested by the Panel, has been completed as a separate report to the Panel. Participants at the meeting included the following persons:

Canadian Department of Fisheries and Oceans (DFO)
- Sandy Johnston (co-chair)
- Ian Boyce
- Gail Faulkner

Contractors (Canada)
- Mary Ellen Jarvis
- Trix Tanner

Alaska Department of Fish and Game (ADF&G)
- Elizabeth Andrews
- Bonnie Borba
- Jeff Bromaghin
- Larry Buklis (co-chair)
- Russ Holder
- Robert McClain
- Robert Paulus

United States Fish and Wildlife Service (USFWS)
- Steve Klosiewski
- Rod Simmons
- Tevis Underwood

National Marine Fisheries Service (NMFS)
- John Eiler
- Dick Wilmot

Bering Sea Fishermen's Association (BSFA)
Jude Henzler

Attachment I provides the updated historical Yukon River salmon catch and escapement data in graphic and tabular form. Note that the Alaska commercial catch information in Attachment I is in numbers of salmon. As in the past, salmon roe sales have been converted to the number of salmon estimated to have been caught to produce the reported weight of roe sold.

2.0 1997 COMMERCIAL FISHERY - ALASKA

Preliminary estimates of commercial sales totaled 300,116 salmon and 87,686 pounds of unprocessed salmon roe (Table 1) for the Alaskan portion of the Yukon River drainage (Figure 1) in 1997. Note that the 1997 Alaskan commercial harvest is expressed as the number of salmon sold in the round, pounds of salmon roe sold, and estimated harvest which includes the estimated number of salmon harvested to produce roe sold. Total sales were composed of 112,841 chinook, 95,242 summer chum, 56,713 fall chum, and 35,320 coho salmon sold in the round (Table 1). Roe sales by species totaled 3,225 pounds for chinook, 83,267 pounds for summer chum, and 1,194 pounds for fall chum salmon. The total estimated commercial harvest was 435,369 salmon; 113,610 chinook, 228,252 summer chum, 58,187 fall chum, and 35,320 coho salmon.

Both summer and fall chum salmon abundance was below average in 1997. Declining salmon markets for chum salmon flesh and roe also had a major impact on the summer chum salmon commercial fishery in Alaska. This resulted in a reduction in fishing and buying effort, which limited summer chum harvests in most districts and lowered exvessel value. With regards to fish sold in the round, the chinook salmon harvest was 5% above the 1992-96 average; the summer chum salmon harvest was 48% below the average; the fall chum salmon harvest was 22% below the average; and the coho salmon harvest was 68% above the average (Table 2). Chinook salmon roe sales were 12% above the 1992-96 average; summer chum salmon roe sales were 51% below the average; and fall chum roe sales were 89% below the average. No coho salmon roe was sold in 1997. Note that salmon roe sales data were not available for chinook and coho salmon prior to 1990 (Table 2).

Fishing effort was lower than normal because of the below average chum salmon runs and declining chum salmon markets and corresponding lower prices. A total of 725 permit holders participated in the fishery during 1997 (Table 1), which was 8% below the recent five-year-average and the lowest on record since 1972. A total of 640 permit holders fished in the Lower Yukon Area in 1997 which was 3% below the recent five-year-average. A total of 85 permit

holders fished in the Upper Yukon Area, which was 34% below the recent five-year-average of 129 permits and the lowest on record since 1973.

Yukon River fishermen in Alaska received an estimated $5.9 million for their catch in 1997, approximately 12% below the recent 5-year average of $6.7 million. Five buyer-processors operated in the Lower Yukon Area, and six buyer-processors and 10 catcher-sellers operated in the Upper Yukon Area of Alaska.

Lower Yukon fishermen received an average landed price per pound of $2.46 for chinook, $0.10 for summer chum, $0.22 for fall chum, and $0.32 for coho salmon. Upper Yukon commercial fishermen received an estimated per-pound average price of $0.97 for chinook salmon, $1.62 for chinook salmon roe, $0.07 for summer chum salmon, $1.08 for summer chum salmon roe, $0.17 for fall chum salmon, $1.75 for fall chum salmon roe, and $0.20 for coho salmon.

Department test fishing projects sold a total of 2,791 chinook, 2,557 summer chum, 867 fall chum and 498 coho in District 1 and 20 chinook and 33 summer chum salmon in District 2 in 1997. These fish are not included in commercial sales in Tables 1 and 2.

2.1 Chinook and Summer Chum Salmon

The 1997 preseason outlook was for a near average chinook salmon run and a below average to average summer chum salmon run. The commercial harvest in the Alaskan portion of the drainage was anticipated to be between 88,000 and 108,000 chinook and 200,000 to 600,000 summer chum salmon.

The Lower Yukon Area was generally free of ice by 15 May. The first chinook salmon catches were reported on 22 May near Sheldon Point by a subsistence fisher. The department's test fishing projects recorded the first chinook and chum salmon catches on 29 May.

Based on the lower river test fishery, chinook salmon migratory timing was average. Approximately 50% of the chinook salmon run had entered the lower river by 19 June. A record test fishing cumulative catch per unit effort (CPUE) of 35.6 for chinook salmon from Big Eddy and Middle Mouth 8.5 inch mesh size set gillnet sites indicated above average abundance in 1997 and similar to the large runs in 1994 and 1995. Initially, the indication of a strong run was viewed cautiously, as water levels were well below normal through 20 June, which may have resulted in increased efficiency of the test fishery. In addition, one 8.5 inch mesh size gillnet site near Emmonak appeared to be catching chinook salmon with disproportionately high efficiency. For example, this site had a high chinook catch on 17 June, but the numbers of fish caught during the commercial opening that day upstream of the test fishery were very low. Therefore, it was difficult to determine inseason how well the test fishery was performing as an indicator of abundance in 1997.

The test net cumulative CPUE of 81.6 for summer chum salmon indicated the 1997 run was near average in abundance. Again, this indication of abundance was viewed cautiously, as water levels were below normal through 20 June, and then water levels were much higher than normal with a lot of debris from 28 June until 5 July. Summer chum salmon migratory timing appeared to be average with approximately 50% of the run entering the lower river by 19 June. according to test fishing CPUE data. However, the run was more spread out in duration than typical.

The Pilot Station sonar project estimated a passage of 132,000 large chinook and 90,000 small chinook (jacks) for a total of 222,000 chinook, and 1,402,000 summer chum salmon. Because of operational changes, Pilot Station sonar data in 1997 could only be compared directly with data collected in 1995. Operational changes included changes to aiming criteria in 1995 to maximize the ability to detect passing fish, so all detected fish are classified as upstream oriented. Although the total passage estimates for chinook salmon were fairly similar for 1995 and 1997, the passage estimate in 1997 had a much higher proportion of small chinook salmon than the passage estimate of 37,000 small chinook in 1995. This higher proportion of small chinook salmon in the 1997 run was a factor when determining the allowable level of harvest in unrestricted mesh openings because of escapement quality considerations. The 1997 summer chum salmon passage estimate was substantially less than the 1995 estimate of 3,638,000 fish. It will take several more seasons to evaluate the results of the project to determine how sonar passage estimates relate to subsequent harvests and escapements on the spawning grounds.

Preliminary postseason analysis of comparative commercial harvest and escapement data indicated the chinook salmon run was above average in abundance and the summer chum salmon run was below average in magnitude.

The commercial harvest of chinook salmon was above the midpoint of the guideline harvest range for Districts 1 and 2 and slightly above the upper end of the guideline harvest ranges in Districts 5 and 6. However, declining salmon market conditions resulted in no commercial openings in District 3, and a limited chinook salmon harvest in District 4. Because of a below average summer chum run and weak chum salmon flesh and roe markets, commercial harvests in all districts were below the lower end of the guideline harvest ranges except for District 6 where the harvest was at the midpoint. Chum salmon roe markets which had remained relatively stable through 1996 were very disappointing in 1997.

The anticipated Lower Yukon Area commercial harvest was 82,000 to 100,000 chinook salmon. However, the harvest from fishing periods targeting chinook salmon with unrestricted mesh size gillnets was not expected to exceed 85,000 fish. The management concern is to protect the production quality of escapements, that is, not only escapement abundance but the proportion of female salmon in the escapement. Large mesh size gillnets utilized during unrestricted mesh size openings target older, larger chinook salmon, which includes a much larger proportion of females than small mesh size periods. Fishing periods restricted to six inch or smaller mesh size gillnets result in much higher catches of smaller predominantly male chinook salmon. Therefore, the

amount of harvest taken with the larger mesh chinook salmon gear and smaller mesh gear must be carefully considered.

The normal management strategy is to open the chinook salmon directed commercial fishery in the Lower Yukon Area when increasing subsistence and/or test net catches of chinook salmon have occurred over a seven- to ten-day period. The 1997 commercial fishing season opened on 11 June in District 1 after approximately seven days of increasing subsistence and test fishery catches.

Through 22 June, a series of three 12-hour commercial fishing periods allowing the use of unrestricted mesh size gillnets were established in Districts 1 and 2. After the combined District 1 and 2 harvest reached approximately 70,000 chinook salmon on 23 June, fishing time for the fourth period in each district was reduced to 6 hours in duration. In addition to an inseason assessment of a near average run at that time, there was concern for meeting subsistence priorities upriver above Anvik, because of high water and high debris load during the last two weeks of June. The last period with unrestricted mesh size gillnets was nine hours in duration in District 1 on 26-27 June. On 1-2 July, the department was willing to allow an additional unrestricted mesh size opening. However, all of the buyers were closing up because of quality concerns for late run chinook and cost savings measures. Based on test fishing CPUE data and Pilot Station sonar passage estimates, the run was assessed inseason to be above average but lower in magnitude than 1995, and the harvest of chinook salmon with unrestricted mesh size gillnets was allowed to exceed 100,000 fish.

Six inch maximum mesh size fishing periods are utilized to target summer chum salmon in the Lower Yukon Area. Several buyers were interested in purchasing summer chums during the middle to late-June time period. There were four short chum salmon directed periods in 1997 between 22 June and 30 June. Because of the low prices paid for summer chum salmon, lack of buyers in early July and below average return, the Lower Yukon Area summer chum harvest was below the lower end of the guideline harvest range.

The combined total harvest of 105,747 chinook salmon for Districts 1 and 2 (Table 1) was 17% above the midpoint of the guideline harvest range of 90,000 fish and 3% above the 1992-1996 average harvest of 102,342 fish. A total of 102,114 chinook were harvested during unrestricted mesh size fishing periods and 3,611 chinook were harvested during fishing periods restricted to six inch maximum mesh size gillnets. The average weight of chinook salmon was 21.2 pounds for the unrestricted mesh size harvest and 14.2 pounds for the six inch maximum mesh size harvest.

The combined commercial summer chum salmon harvest in District 1 and 2 of 78,157 fish (Table 1) was 52% below the recent 5-year-average harvest of 164,393 fish. A total of 49,953 summer chum salmon were caught during the unrestricted mesh size periods and 28,204 summer chum salmon were harvested during restricted mesh size fishing periods. The average weight of summer chum salmon was 7.2 pounds.

Preliminary age composition data from the Lower Yukon Area indicated 6-year-old fish accounted for approximately 82% of the chinook salmon samples from the commercial harvest. This was consistent with the above average return of 5-year-old fish in 1996, but inconsistent with the below average to average escapements documented in the 1991 parent year. Approximately 50% of the chinook salmon commercial harvest in District 1 and 2 was females. Five-year-olds comprised approximately 75% of the summer chum salmon samples taken from the lower river commercial harvest.

Although a small amount of summer chum roe was sold in District 3 in 1996, poor market conditions precluded commercial fishing in 1997. Although one fishermen and buyer expressed interest in taking summer chum salmon for the sale of roe, this market failed.

Because of lower effort and subsequent lower harvest rates, more fishing periods were allowed in the Anvik River Management Area and District 4 fisheries than in recent years. The Anvik River had 11 fishing periods, the most since its inception in 1994. Subdistrict 4-A had 10 fishing periods and Subdistricts 4-B and 4-C had 8 fishing periods, the most for each subdistrict since 1989.

Subdistrict 4-A was opened to commercial fishing on 1 July. Based on the below average summer chum salmon run, the lower end of the guideline harvest range of 61,000 pounds of roe for Subdistrict 4-A was targeted inseason. A total of 56,301 pounds of summer chum salmon roe was sold in Subdistrict 4-A (Table 1).

This was the fourth consecutive year that commercial fishing was allowed within the Anvik River Management Area. A three 12-hour period per week fishing schedule was maintained throughout the entire season. Generally, fishing periods were scheduled concurrently with Subdistrict 4-A openings; two fishing periods were not concurrent. A total of 13,067 pounds of summer chum salmon roe were sold in the Anvik River Management Area (Table 1).

Subdistricts 4-B and 4-C had uninterrupted subsistence fishing allowed by emergency order until 24 hours before the commercial fishing season opened. Subdistricts 4-B and 4-C were opened to commercial fishing beginning on 29 June (Table 1). The sale of 4,863 pounds of summer chum salmon roe in Subdistricts 4-B and 4-C was the second lowest on record since 1980. The chinook salmon harvest was 1,457, which was below the lower end of the guideline harvest range (Table 1).

The commercial fishing season was opened in Subdistricts 5-A, 5-B, and 5-C on 4 July after the chinook salmon run was believed to be well distributed throughout these subdistricts. The harvest of 3,071 chinook salmon was slightly above the upper end of the guideline harvest range of 2,800 fish for Subdistricts 5-A, 5-B, and 5-C. A total of 125 summer chum were sold (Table 1).

Commercial fishing in Subdistrict 5-D commenced on 12 July. The Subdistrict 5-D harvest of 607 chinook salmon was slightly above the guideline harvest range of 300 to 500 chinook salmon.

The total estimated commercial harvest in 1997 was 2,728 chinook and 25,287 summer chum salmon in District 6. The chinook salmon harvest exceeded the upper end of the guideline harvest range of 800 fish. The summer chum salmon harvest reached the mid-point of the guideline harvest range of 13,000-38,000 fish. Management of the fishery was primarily based on Chena and Salcha River tower counts and aerial survey results. The first two fishing periods were directed at the harvest of chinook salmon and the five following periods were directed at summer chum salmon. Based on commercial harvest and escapement data, the chinook salmon run to the Tanana River drainage was above average, while the summer chum salmon run appeared to be average, and stronger than expected based on the 1993 parent year escapements.

2.2 Fall Chum and Coho Salmon

Yukon River drainage fall chum salmon return primarily as age-4 or age-5 fish. However, age-3 and age-6 fish also contribute to the run. A Ricker spawner-recruit model was used to project the returns of fall chum salmon from the 1991 to 1994 parent-years that contributed to the 1997 run. This process resulted in a 1997 preseason projection of 750,000 fall chum salmon.

The preseason projection suggested that the major contributor to the 1997 fall chum salmon run would be age-4 fish returning from the 1993 brood year. In 1993, the Yukon River drainage experienced the lowest fall chum salmon run on record, and no commercial fishing was permitted in the Alaskan portion of the drainage during the 1993 fall season. Additionally, severe restrictions, which included closures, were imposed on the recreational, personal use, and subsistence fisheries. Despite these efforts, the 1993 fall chum salmon escapements throughout most of the Yukon River drainage were poor. However, in 1993 the most favorable escapements observed, when compared to respective escapement goals, were within the Tanana River drainage. When compared to its historical contribution, it was anticipated that the fall chum salmon return to the Tanana River drainage would be a strong component of the 1997 return.

The preseason projection also suggested that one of the weaker components of the 1997 fall chum salmon run would be from the Canadian mainstem stocks. Management strategies to increase the number of fall chum salmon delivered to the border included a lower, overall commercial-exploitation rate on the entire fall chum salmon run. Additionally, attempts were made to allow the early portion of the fall chum salmon run to pass through the lower Yukon River prior to commercial fishing activities, because it is believed that Canadian bound salmon represent a higher proportion of the fish during the early portion of the run.

The Alaska Board of Fisheries adopted the Yukon River fall chum salmon management plan that was in effect during the 1997 season. The 1997 management plan directed that Alaskan fall chum salmon commercial fisheries may only be allowed at run size projections greater than 600,000 fall chum salmon. The 1997 preseason projection of approximately 750,000 fall chum salmon suggested that an Alaskan fall chum salmon commercial harvest of up to 150,000 fall chum

salmon could occur given healthy stocks and normal distribution. However, rebuilding efforts for Canadian and Toklat River drainage fall chum salmon stocks would reduce the allowable Alaskan commercial harvest.

As the 1997 run materialized inseason, the department used inseason management tools to adjust the run size projection and the corresponding, allowable Alaskan commercial harvest upward or downward. Lower Yukon River monitoring tools available to the department in 1997 included the lower Yukon River set gillnet test fishery, the Mountain Village drift gillnet test fishery, Pilot Station sonar passage estimates, and subsistence catch reports. This information, in combination with the preseason projection, was the basis for the initial management decisions in the lower Yukon River commercial fisheries.

By early August, it was estimated that the 1997 fall chum salmon return would be large enough to support commercial fishing activities. The first commercial fishing period in 1997 directed toward fall chum salmon occurred in District 1 on 6 August. As the run progressed in time and migrated upriver, additional commercial fishing opportunities occurred throughout most of the Yukon River (Districts 1, 2, 4, and 5). No Yukon River District 3 commercial fishing activities occurred during the fall season due to the lack of a buyer. Based primarily on Pilot Station sonar passage estimates (approximately 622,000 fall chum salmon as of 31 August, the last day of operation) the 1997 Yukon River fall chum salmon return was estimated inseason to be approximately 675,000 fish through the end of August. This level of return, when compared to the management plan, could provide for a limited Alaskan commercial harvest below the low end of each district(s) or subdistrict(s) guideline harvest range. The combined total of the low end of all Yukon Area guideline harvest ranges is 72,750 fall chum salmon.

A total of 56,713 fall chum salmon in the round and 1,194 pounds of fall chum salmon roe were sold in 1997. Applying an average figure for pounds of row per female, the estimated total harvest was approximately 58,187 fall chum salmon. The 1997 estimated harvest was approximately 55% of the recent (1992 to 1996) five-year-average (approximately 106,000 fall chum salmon). All district(s) or subdistrict(s) harvests were between 49% and 86% of the low end of their respective guideline harvest range, except for District 6. As the fall chum salmon run progressed upriver, additional escapement and monitoring information became available. In 1997, inseason run strength indicators suggested that the Tanana River component of the 1997 Yukon River fall chum salmon return was weaker than anticipated. Based on inseason indicators, no fall season commercial fishing was allowed in District 6, the Tanana River, in 1997.

Yukon River coho salmon have a slightly later but overlapping run timing with that of the fall chum salmon run. Comprehensive escapement information on coho salmon within the Yukon River drainage is limited. Yukon River coho salmon return as primarily age-4 fish. Results from limited escapement surveys conducted in 1993, assuming average survival, suggested that no better than an average abundance of coho salmon would return to the Yukon River drainage in 1997.

No commercial guideline harvest ranges have been established for Yukon River coho salmon. However, the Yukon River Drainage Fisheries Association has submitted a proposal to the Alaska Board of Fisheries requesting the development of a Yukon River coho salmon management plan. The Board of Fisheries will be reviewing this proposal in December 1997. If adopted, a coho salmon management plan would allow for a directed Alaskan coho salmon commercial fishery During the 1997 fishing season, the commercial harvest of coho salmon was a function of the timing, frequency, and duration of the periods established for the more numerous fall chum salmon. A total of 35,320 coho salmon were sold, all in the round. The majority (approximately 98%) of the coho salmon harvest occurred in Districts 1 and 2. The 1997 Yukon Area coho salmon harvest was 53% above the recent five-year-average (1992-1996) of approximately 23,000 fish.

3.0 1997 COMMERCIAL FISHERY - CANADA

The management plans for the Canadian chinook and chum salmon fisheries on the Yukon River in 1997 were formulated to reflect the understandings reached in the Interim Yukon River Salmon Agreement (IYRSA) and in recent Yukon River Panel meetings. Accordingly, the guideline harvest ranges, and the border and spawning escapement goals for upper Yukon chinook and chum salmon, that were established in the IYRSA and subsequent Panel meetings, provided the foundation for the 1997 management plans.

A preliminary total of 13,187 salmon including 5,311 chinook salmon , 7,874 chum salmon and 2 coho salmon was harvested in the 1997 Canadian Yukon River commercial fishery (Table 3). This was the lowest combined commercial catch since 1976 and was attributed to poor market conditions, high water conditions throughout the chinook season and a closure in the fishery for the first half of the chum season due to an anticipated below average return.

A total of 27 commercial licenses was issued in 1997, one less than in 1996. The maximum number of commercial fishers active during any one week of the chinook salmon season was 14 fishers. During the chum season, the highest number of fishers present in any one opening was only 5 fishers. Most of the commercial chinook harvest was taken by gill nets set in eddies. Four fishwheels were in use during the chinook season; three fishwheels were in use during the chum season.

3.1 Chinook Salmon

With the preseason expectation of a total run size of about 134,000 Canadian-origin mainstem Yukon River chinook salmon in 1997, which was close to the recent cycle average of

approximately 140,000 chinook, the elements of the chinook management plan adopted for 1997 included:

i) a minimum escapement goal of 28,000 chinook as agreed by the Yukon River Panel in the spring of 1996. This new goal, established as part of an upper Yukon chinook rebuilding plan, replaced the 1990-1995 stabilisation goal of a minimum 18,000 chinook salmon;

ii) a total upper Yukon guideline harvest range for all users of 16,800 to 19,800 chinook salmon, which was the range agreed to in the IYRSA. It was expected the U.S. would manage to a border escapement goal of at least 46,300 chinook;

iii) a commercial guideline harvest range of 8,500 to 11,500 chinook, with a preseason target of 10,000 chinook. Based on the preseason forecast for an average return, the catch was expected to be close to the mid-point of the range; and

iv) a 10-14 day delay in the opening of the fishery.

This fishing plan was similar to the plan developed for 1996 except for the schedule adopted for the fishery opening. From 1990 through 1996, annual management plans specified one-day/week openings for the first two weeks of the chinook season; in 1997, the one-day openings were forfeited in return for a three day opening which was scheduled to occur ten days after the run was deemed to have commenced. If a conservation concern arose during this period, the three-day opening would be delayed until 14 days after the run had commenced.

Two limiting factors dominated the commercial fishery in 1997: the Han Fish Plant in Dawson City, which in years dating back to the early 1980's had been the primary market for the fishery, remained closed throughout the year; and, usually high water conditions persisted throughout the chinook season. These factors resulted in below average weekly catches, reduced effort and catch per unit of effort (CPUE).

The commercial fishery opened on Sunday, 13 July (statistical week 29), 10 days after the run had begun. The first chinook was caught in the DFO fishwheels on 26 June but catches remained very sporadic through 3 July. The beginning of the run was pegged at 3 July and was marked by a clearly increasing trend in the 3-day moving averages of the DFO fishwheel catches.

The catch during the 13 July to 16 July three-day opening (statistical week 29) of the commercial fishery, consisting of 1,167 chinook for 12 fishers, was 35% below the previous cycle average catch for this week of 1,808 chinook; the catch per unit of effort (CPUE) of 32 chinook/fisher/day, the highest level of the 1997 chinook season, was about 20% below the cycle average for this week.

Below average effort levels in the commercial fishery, above average catches in the DFO fishwheels and a cumulative commercial catch that was approximately one half the weekly guideline harvest for week 29 prompted an increase in fishing time to 5 days per week commencing 20 July, statistical week 30. The peak weekly catch of the chinook season occurred this opening with 1,838 chinook being landed, however the CPUE was 34% below average

Weekly chinook catches continued to be below average from week 31 through week 33 caused by a combination of high water conditions and poor market conditions. As local markets dried up, the number of commercial fishers progressively declined over the chinook season from 12 fishers in week 29, to 9 in weeks 30 and 31, 3 in week 32 and 2 in week 33.

Unlike previous years, inseason run forecasts did not play a significant role in the management of the fishery in 1997. Normally, inseason forecasts are used to adjust the total commercial chinook harvest target within the overall commercial guideline harvest range according to run size. Early in the 1997 season, it was clear that even the lower end of the commercial guideline harvest would not be achieved given the poor market conditions. Nevertheless, forecasts were made during the latter half of the season. The first inseason forecast of border escapement based on mark-recapture results was made during week 31 (using tag recoveries through 1 August). This initial forecast of 42,000 to 60,000 chinook indicated an above average run of chinook into the upper Yukon River. Forecasts made during weeks 32 and 33 continued to indicate a border escapement of approximately 60,000 chinook. The final inseason estimate was a border escapement forecast of approximately 53,000 chinook.

The preliminary total commercial chinook catch of 5,311 fish, the lowest catch since 1979, was 51% below average and was approximately one half the preseason target of 10,000 chinook, i.e. the mid-point of the commercial guideline harvest range of 8,500 to 11,500 chinook. For comparison, the recent six-year average commercial catch was 10,912 chinook (1991 to 1996); during this period the catch ranged from 10,164 chinook in 1996 to 12,028 chinook in 1994. The preliminary postseason estimate of the border escapement indicated a Canadian commercial harvest rate of 10% on chinook salmon in 1997 compared to the recent cycle average harvest rate of 24% (1991-1996). Fishing effort during the chinook season, i.e. through week 34, was 44% below average (165 boat-days versus an average of 296 boat-days).

3.2 Fall Chum Salmon

The chum salmon run to the upper Yukon was expected to be poor in 1997 due to the record low escapement of 29,743 chum salmon in 1993 and the below average escapement of 49,082 chum in 1992. The 1997 Canadian chum salmon management plan was developed to address the expectation of a poor run and the objectives of the three-cycle rebuilding plan that has been agreed to in the IYRSA. Accordingly, the plan included the following components:

i) an escapement goal of 55,000 upper Yukon chum salmon. This goal was adopted by the Canada/U.S. Yukon River Panel in the spring of 1997 and was consistent with the three-cycle chum rebuilding plan which has as its long term objective, an escapement goal of >80,000 chum;

ii) a guideline harvest range for all Canadian upper Yukon fisheries of 23,600 to 32,600 chum as agreed to within the IYRSA. Given the poor run outlook, it was suggested that it would be optimistic to expect a total Canadian catch of 23,600 chum, i.e. the lower end of the overall range. It was expected the U.S. would manage to a border escapement goal of >78,600 chum which would satisfy the spawning escapement goal and the lower end of the Canadian guideline harvest range as per the Interim Yukon River Salmon Agreement;

iii) a commercial guideline harvest range of 20,500 to 29,500 chum. However, given the conservation concern in 1997, there was little expectation that the commercial catch would achieve even the lower end of the range;

iv) subject to confirmation on 8 August, the commercial and domestic fisheries were scheduled to be closed 15 August through 12 September, i.e. the first half of the chum season. During this period, data was to be collected regarding the status of the run which would be used in decisions about openings after 12 September. On 12 September and thereafter, if the chum run size in the upper Yukon River (i.e. border escapement) was forecast to be less than 60,000 fish, the commercial and domestic fisheries would be closed in the following week. A forecast of >60,000 could result in a restricted opening the following week. Openings in subsequent weeks were to be dependent on updates on run abundance, conservation concerns, allocation priorities, and the status of the cumulative catch relative to harvest guidelines.

The plan to close the commercial chum fishery for the first half of the season was unprecedented. It was made possible by the development of a co-operative stock assessment program between the Yukon River Commercial Fishermen's Association and DFO to collect data that would allow non-lethal estimation of the run size during the proposed closure. This program, which employed five fishers and involved the use of four fishwheels to live-capture tagged chum salmon, was funded by the Yukon Restoration and Enhancement Fund of the Yukon River Panel.

On 08 August, the indications of the fall chum run size were no better than expected: the cumulative catch of chum salmon in DFO fishwheels was 78% below average and the run indicators in the lower river in Alaska gave no reason for optimism - total run forecasts were below expectations. Therefore, the decision was made to proceed with the closure of the commercial and domestic fisheries from 15 August through 12 September. During this period, the Yukon Commercial Fishermen's Association operated four fishwheels equipped with live boxes for approximately four days per week and caught a total of 3,746 chum, 122 of which were tagged.

On 12 September, all of the available chum mark-recapture data was reviewed along with run indicators in Yukon and Alaska. The DFO wheel catch relative to average had improved significantly; although the cumulative catch was still below average (18% below average), daily catch rates were at average levels. If the fishwheel catches were indicative of run strength, a run of 18% below average would translate into a total border escapement of approximately 85,000 chum. Based on mark-recapture data collected during the closure, the border escapement forecast ranged from approximately 63,000, if the run timing was normal, to 91,000 chum if the run timing was delayed by five days. Information from Alaska at this time indicated the overall fall chum run to the mouth was somewhat below expectation but had been sufficient to conduct a limited commercial fishery. The lower river test fishery at the mouth was average in strength and indicated slightly delayed run timing. The Pilot Station sonar passage estimate through August was 622,000 fall chum, about one half the 1995 level. The Rampart tagging fishwheel catch in the upper Yukon River in Alaska was roughly 27,000 chum, which was much higher than expected and only 22% below the number caught in 1996 to this date; in 1996 the number of chum salmon reaching the border was the second highest on record. Both the Chandalar and Sheenjek counts were on track to meet or exceed average levels. Only the north bank fishwheel located near the confluence of the Yukon and Tanana rivers indicated poor upper Yukon chum run abundance.

The indicators of run size in the upper Yukon, supported less specifically by Alaskan data, suggested the run would be greater than 60,000 chum, the threshold value that was selected in the Canadian fishery management plan for initiating a restricted commercial fishery. Therefore, a decision was made to open the fishery the following week for two days, from 15-17 September. Only 5 fishers chose to fish this opening landing a total of 2,357 chum salmon. The CPUE of 262 chum/fisher/day was 50% above the previous ten-year average for this week and was just shy of the record of 270 chum/fisher/day established in 1992. The run forecast, updated at the end of week 38 (week ending 20 September) with two days of commercial tag recovery data and two days of live-capture data, ranged from 61,000 chum assuming average run timing, to, 89,000 chum assuming the run was 5 days late. At a minimum, the total allowable catch (TAC) for the season was estimated to be 6,000 chum (61k minus the spawning escapement goal of 55k) but the cumulative commercial catch was less than 2,400 chum to this point in time. Daily DFO fishwheel catches had continued to hold at average to above average levels and the Alaskan run indicators previously mentioned had not changed for the worse. These factors prompted the announcement of a two-day fishery for the following week (statistical week 39) from 22-24 September.

The fishery in week 39 resulted in a harvest of approximately 2,100 chum which was taken by 5 fishers. Although the CPUE dropped by about 54 chum/fisher/day over the previous week, it was still 18% above average. Based on the mark-recapture data updated through week 39, the run forecast increased significantly to a range of 79,000 to 97,000 chum.

With the improvement in the run forecast, fishing times were extended to four days/week in week 40 (29 September - 2 October) and week 41 (6-10 October). During this time, the number of fishers declined to three fishers in week 40 and two in week 41. Weekly CPUE values, likely biased upwards somewhat by the low number of fishers, were at record levels and were roughly 2.3 times the previous ten-year respective weekly averages. Although a three day fishery was posted for 14-17 October, there was no fishing activity due to a sudden drop in air temperatures and the appearance of ice flows in the river just prior to the opening.

The preliminary total commercial chum harvest of 7,874 fish was the second lowest catch since 1978; since 1978, the lowest catch, 7,762 chum, occurred in 1993 (the primary brood year for 1997) when the fishery was closed 21 September due to conservation concerns. The 1997 catch was 67% below the recent four-year cycle average commercial catch of 24,220 (1993-1996) and was 62% below the lower end of the 1997 commercial guideline harvest range of 20,500 to 29,500 chum salmon. Based on preliminary tag recovery data, the harvest rate in the commercial fishery was approximately 8% compared to the 1993-1996 cycle average of 19%.

Total fishing effort during the chum season (from week 35 on) was 37 boat-days in 1997, by far the lowest on record and 75% below the 1993-1996 average of approximately 146 boat-days. The total number of days fished during this period, i.e. after week 35, was 15 days which equaled the 1993-1996 average. Once the chum closure was announced in early August, most fishers left the fishery for the season to seek employment elsewhere.

4.0 1997 SUBSISTENCE, PERSONAL USE, ABORIGINAL, DOMESTIC, AND SPORT FISHERIES

4.1 Alaska

4.1.1 Subsistence

Subsistence "catch calendars" were mailed in May, for use during the fishing season, to rural community households in the non-permit portions of the Yukon River drainage in Alaska. Catch calendars are collected during the personal interviews that are conducted with fishermen immediately following the season in September and October. Subsistence fishermen in portions of District 5 (upper Yukon River drainage) and District 6 (Tanana River drainage) are required to obtain subsistence salmon fishing permits and record harvest data on the permit. Personal use permits are required for fishermen who fish in the Fairbanks Nonsubsistence Area. Additionally, attempts are made to contact fishermen by telephone or mail. Preliminary analysis of 1997 subsistence harvest data will not be completed until early 1998. The estimated 1996 subsistence salmon harvest in the Alaska portion of the Yukon River drainage totaled approximately 43,000 chinook, 103,000 summer chum, 129,000 fall chum, and 30,000 coho salmon. These estimates do

not include personal use catches in the Fairbanks Nonsubsistence Area and do not include commercially-caught salmon carcasses retained for subsistence purposes.

4.1.2 Personal Use Fishery

Regulations were in effect from 1988 until July 1990 that prohibited non-rural residents from participating in subsistence fishing. In those years, non-rural residents harvested salmon under personal use fishing regulations. The Alaska Supreme Court ruled, effective July 1990, that every resident of the State of Alaska was an eligible subsistence user, making the personal use category essentially obsolete. From July 1990 through 1992 all Alaskan residents qualified as subsistence users. In 1992, during a special session of the legislature, a subsistence law was passed which allowed the Alaska Joint Boards of Fisheries and Game to designate non-subsistence areas. This law allowed the boards, acting jointly, to identify an area or community in which subsistence is not a principal characteristic of the economy, culture, and way of life. The Fairbanks Nonsubsistence Area was the only non-subsistence use area identified by the Joint Boards of Fisheries and Game. This area includes the Fairbanks North Star Borough and surrounding areas. In October 1993, a Superior Court ruled that this 1992 subsistence law was unconstitutional. The State was immediately granted a stay which allowed for status quo fishing regulations to remain in effect until April 1994. At that time, the Alaska Supreme Court vacated the State's motion for a stay. This action resulted in all Alaskan residents being eligible to fish for subsistence purposes during the 1994 fishing season.

In 1995, the Joint Board of Fisheries and Game again adopted the Fairbanks Nonsubsistence Area. Subsistence fishing is not allowed within non-subsistence areas. This new regulation primarily affected salmon fishermen within Subdistrict 6-C, which falls entirely within the Fairbanks Nonsubsistence Area. From 1995 through 1997 the Subdistrict 6-C salmon fishery was managed under personal use regulations. Personal use salmon harvest in this subdistrict is limited to 750 chinook salmon, 5,000 summer chum salmon, and 5,200 fall chum and coho salmon combined. Preliminary data compilation for the 1997 fishing season will not be completed until early 1998. In 1996, 133 fishermen were issued personal use salmon fishing permits. Fishermen fishing under personal use regulations harvested approximately 200 chinook, 900 summer chum, 350 fall chum, and 200 coho salmon.

4.1.3 Sport Fishery

Approximately ninety percent of the sport fishing effort in the Alaskan portion of the Yukon River drainage occurs in the Tanana River drainage, mostly along the road system. Only a small portion of the effort is directed toward anadromous salmon, although sport fisheries targeting some of those stocks occur annually in the Chena, Salcha, Chatanika, and other Interior Alaska river systems. Sport fishing effort and harvests are monitored annually through a state-wide sport

fishery survey. Some on-site fishery monitoring also takes place at locations where more intense sport fishing occurs. Although some fall chum salmon may be taken by sport fishers, the majority of the harvest of that species is thought to come from the summer chum salmon run because 1) that run is much more abundant, and 2) the chum harvest is typically incidental to effort directed at chinook salmon which overlap in timing with summer chum. For these reasons, all of the sport fishing chum salmon harvest is reported here as summer chum salmon. Yukon River drainage sport harvest estimates for recent years (1992-96) have averaged about 1,800 chinook salmon, 1,000 chum salmon, and 1,500 coho salmon. Sport harvest of salmon in the Alaskan portion of the Yukon River drainage in 1996 was estimated to total 3,151 chinook salmon, 1,854 chum salmon, and 1,588 coho salmon. At this time, no harvest information is available for 1997.

4.2 Canada

4.2.1 Aboriginal Fishery

The second year of a multi-year comprehensive survey of the Aboriginal fishery was conducted in 1997 as part of the implementation of the Yukon Comprehensive Land Claim Umbrella Final Agreement. The project entitled: *The Yukon River Drainage Basin Harvest Study*, is being conducted by LGL Ltd. Environmental Research Associates, and primarily involves intensive inseason surveys of catch and effort in the fishery throughout the upper Yukon drainage, excluding the Porcupine drainage. Catch estimates from the Porcupine River in the Old Crow area were, and are currently being, determined independently from locally conducted, post season interviews for chinook and chum salmon and inseason for coho salmon.

The preliminary estimate of the 1997 total upper Yukon chinook salmon catch in the Aboriginal fishery was 8,942 fish (std = 308), 18% above the 1991-1996 cycle average of 7,570 chinook. For 1996, the final estimate of chinook harvest in the upper Yukon area has been updated to 8,451 fish. At Old Crow, the preliminary estimated chinook harvest is 496 fish, however approximately one half of the interviews have yet to be completed.

The preliminary estimate of the 1997 harvest of upper Yukon chum salmon in the Aboriginal fishery is 1,216 fish (std = 149) compared to the recent cycle average of 3,085 chum salmon. The chum catch in 1996 was estimated to be 1,260 fish. In the Old Crow fishery, 4,144 chum salmon were harvested (preliminary) in the Porcupine River near Old Crow. This number will change since approximately one half of the interviews have yet to be completed.

Coho catches in Canada are generally limited to the Porcupine River where they are taken in the Old Crow fishery in late October and November. Catch information for 1997 was not available for this report.

4.2.2 Domestic Fishery

Effort level was low in the 1997 domestic fishery with only three of seven fishers reporting catches to date. The preliminary total harvest of 121 chinook salmon was well below the previous cycle average of 260 chinook salmon. No chum salmon were reported caught in the fishery in 1997; chum salmon have not been recorded in the domestic fishery catch since 1989.

4.2.3 Sport Fishery

A creel census was conducted for the second consecutive year at the sport fishery located at the confluence of Tatchun Creek and the Yukon River. Between 23 July and 28 August, a total of 1,291 angler interviews was conducted. Preliminary results indicated that a total of 1,310 chinook salmon was caught of which 615 (47%) were retained. This represents respective increases of 34% and 36% over the number of fish caught and the number of chinook retained in 1996. In 1996, 846 chinook salmon were caught of which 395 chinook were kept - note that the preliminary 1996 catch and retention figures presented in the October 1996 JTC report have been revised. Fishing effort data for 1997 is not yet available.

As in 1996, it is assumed that the Tatchun Creek area sport harvest accounts for approximately 50% of the total recreational harvest of chinook salmon in the Yukon River watershed in Canada. The assumption is based on information provided by a national sport fishing survey which included data on the distribution of salmon fishing in the Yukon and northern British Columbia. Based on this assumption, it is estimated a total of 1,230 Yukon River chinook salmon was harvested through recreational fishing in 1997.

5.0 STATUS OF SPAWNING STOCKS

5.1 Chinook Salmon

5.1.1 Alaska

Yukon River chinook salmon abundance in 1997 was assessed as above average based on the commercial harvest and escapement estimates from selected tributaries. The return of six-year-old chinook salmon was even larger than expected based on the large return of five-year-olds in 1996. Production from the 1991 parent year appears to be very good given the escapements documented that year. Generally, chinook salmon escapements were very good throughout the drainage in Alaska, with minimum escapement goals achieved in all but one surveyed tributary. Minimum aerial survey escapement goals have been established in the East and West Fork Andreafsky, Anvik, North and South Fork Nulato, Gisasa, Chena and Salcha Rivers within the Alaska portion of the Yukon River drainage.

Aerial surveys on the Andreafsky and Anvik Rivers in 1997 may have been somewhat less efficient in stream coverage than in previous years due to the use of the larger Cessna 207. The aircraft could not fly as slow or make some of the tight turns that were flown in 1996 and probably in previous years when smaller and slower aircraft were used. The count estimates recorded in 1997 may be somewhat reduced from previous years relative to the numbers of fish that were actually present on these two rivers.

Chinook salmon escapement to the Andreafsky River appeared to be near the escapement goal level. An aerial survey count of 1,510 chinook salmon in the West Fork Andreafsky, was 8% above the minimum escapement goal of >1,400 salmon. The East Fork Andreafsky River aerial survey count of 1,140 chinook salmon was 76% of the minimum escapement goal of >1,500 salmon. The USFWS weir count of 3,067 chinook salmon for the East Fork Andreafsky River was slightly above the 1996 weir count, but only 53% of the 1995 weir count. Estimated age composition of the samples of chinook salmon collected at the weir site was 53% 4-year old, 16% 5-year-old, and 32% 6-year old salmon. Males were more numerous than females, accounting for 63% of the sample.

An aerial survey of the Anvik River on 23 July, conducted under good conditions, resulted in a record count of 2,690 chinook salmon within the escapement index area, which exceeded the minimum goal of >500. The entire Anvik River survey including the tributaries was 3,979 chinook salmon compared to the minimum escapement objective of >1,300. The escapement distribution appeared to be very good, with spawners spread throughout the drainage and tributaries. Six-year-old chinook salmon dominated escapement samples, accounting for 44% of the total sample. Males were more numerous than females, accounting for 63% of the sample.

An aerial survey was not conducted on the Nulato River due to poor weather conditions. Minimum aerial escapement goals are >800 chinook salmon for the North Fork and >500 for the South Fork Nulato River. An estimate of chinook salmon escapement was provided from a salmon counting-tower project operated by the Nulato Tribal Council, Bering Sea Fishermen's Association (BSFA) and ADF&G. It should be noted that the counting towers were moved upstream a short distance in 1997 to a point where channel depth is uniform and salmon in the middle of the river may be counted more efficiently than in previous years. The tower count was 4,752 chinook salmon, which was the highest recorded since inception of the project in 1994. There is no sampling program to gather age-sex-length (ASL) data for Nulato River chinook salmon escapement.

An aerial survey goal of >600 has been established for the Gisasa River, but in 1997 no aerial survey was conducted on the Gisasa River, a tributary to the Koyukuk River, because of poor weather. The USFWS weir, in operation from 14 June through 27 July, counted 3,764 chinook salmon, which was approximately 93% of the 1995 weir count and second highest on record since initiation of the project in 1994. Chinook were first counted on 27 June and low numbers (<15

fish/day) were still moving up river when the weir was disassembled. Estimated age composition of the samples of chinook salmon collected at the weir site was 37% 4-year old, 27% 5-year-old, and 36% 6-year old salmon. Males were more numerous than females, accounting for 74% of the sample.

A weir was operated on the South Fork of the Koyukuk River in 1997 from 6 July through 19 September by the USFWS, and some chinook were present on the first day the weir was operational. Due to high water conditions, after 15 August there were only four days when the weir was operational (24-27 August). A total of 1,642 chinook salmon were counted, which was 33% above the prior year count of 1,232. Peak passage for chinook salmon was 11 July through 15 July. Six-year-old chinook salmon dominated escapement samples, accounting for 76% of the total sample. Females were more numerous than males, accounting for 62% of the sample.

Since 1993, inseason assessment of chinook salmon escapement to the Tanana River drainage has been based on tower counts of chinook salmon passing the Chena and Salcha River tower sites operated by Sport Fish Division of ADF&G. High, turbid water hampered the operations on the Salcha River several times during the 1997 season. In a number of previous years when counting was hampered by high water, some mark-recapture work was done in selected index areas on both rivers to estimate chinook spawner abundance. In 1997 some mark-recapture work was done on the Chena River, and analysis of that data is continuing. The preliminary tower count estimates for Chena and Salcha Rivers was 13,390 and 18,396 chinook salmon respectively. The minimum aerial survey escapement goals for the Chena River and Salcha River index areas are >1,700 and >2,500 salmon respectively. An aerial survey of the Chena River conducted on 18 July under good conditions, resulted in a count of 3,495 chinook salmon in the index area, which was double the minimum escapement goal for this index area. An aerial survey of the Salcha River index area on 1 August under poor conditions resulted in a count of 3,458 chinook salmon, which was 38% above the minimum escapement goal. Age and sex composition samples were collected in 1997 from carcass surveys on both rivers. Analysis of these data are not yet complete.

During 1997 a mark-recapture study was conducted by Sport Fish Division of ADF&G in the Chatanika River to estimate escapement of chinook salmon. The preliminary estimate was 3,429 chinook salmon. No escapement objectives exist for this stock, however semi-annual aerial surveys have been conducted in past years. An aerial survey was conducted during 1997 on 17 July. Survey conditions were judged to be good-fair, but the survey was conducted prior to peak escapement, and only 51 chinook salmon were observed.

In 1997, the U.S. Department of the Interior, Bureau of Land Management (BLM) operated a weir on Beaver Creek from 14 June through 11 August. The weir count of 315 chinook salmon was 54% higher than in 1996. Peak passage occurred between 19 July and 26 July.

5.1.2 Canada

The preliminary tagging estimate of the total spawning escapement for the Canadian portion of the upper Yukon drainage is 37,796 chinook salmon, 41% above the 1991-1996 average of 26,864 chinook. Results of the DFO tagging programme are discussed in greater detail in Section 6.2.2 of this report.

Aerial surveys were conducted by DFO of index areas on the Little Salmon River, Big Salmon River, Wolf River, Nisutlin River, and Tincup Creek, once per index. The Ross River index was not flown in 1997 due to reportedly turbid conditions; similar to those encountered there in 1995 and 1996. These unfavourable counting conditions may be the result of an extensive burn in the area in 1994. Results relative to the previous cycle average are presented below. Surveys are rated according to fish countability. Potential ratings include excellent, good, fair and poor. Surveys with ratings other than poor are considered useful for inter-annual comparisons. Historical counts are documented in Attachment I.

The Little Salmon aerial survey was flown on 17 August. Countability was rated as good. A total of 1,025 chinook salmon was observed. This count is 68% above the recent cycle average (1991-1996). The Big Salmon River, Nisutlin River, and Wolf River indices were flown on 21 August. Excellent viewing conditions were encountered due to favourable water levels and clear, calm weather. Consequently the countability on the Big Salmon River, and the Wolf River was rated as excellent and that on the Nisutlin was rated as good to excellent. (The Nisutlin index is somewhat wider than those these other rivers; consequently the countability can be lower.) A total of 1,345 chinook salmon were enumerated on the Big Salmon River index, 3% above the recent cycle average. The Nisutlin River index count of 307 chinook salmon was 29% below average. On the Wolf River index, 322 chinook salmon were observed: this count was 7% above average. The final chinook aerial survey conducted by DFO was on Tincup Creek, on August 22; the visibility was excellent for the majority of the index area; on a small section of the index (where on recent surveys few fish have been observed) it was poor - consequently overall the survey was rated as good.

Timing of the surveys appeared to coincide with peak spawner abundance. Note that single surveys do not capture the entire escapement, since runs are usually protracted with early spawners disappearing before the late ones arrive. Weather and water conditions, spawner density, as well as observer experience and bias also affect accuracy.

The Whitehorse Fishway chinook salmon count (2,084 fish), provided by the Yukon Fish and Game Association, was close to the second highest on record. The sex ratio observed at the fishway was 51% female. Further details are given in Section 6.2.4.

The Yukon Fish and Game Association also operated a weir on Wolf Creek , upstream of the Whitehorse Fishway, which provided a count of 61 chinook salmon, 34% of which were female (see Section 6.2.5).

The Blind Creek weir project by the Ross River Dena Council provided a count of 957 chinook salmon between 25 July and 22 August, 1997. Of the 918 fish sexed, 416 (45%) were female. A weir project was also conducted for the first time on Tatchun Creek (operated by Quixote Consulting and funded by the Yukon River Restoration and Enhancement Fund), from July 26 until 3 September; 1,198 chinook salmon were enumerated. The Tatchun Creek foot survey result (266 chinook salmon) accounted for 40% of the weir count at the time the survey was conducted (19 August) . The survey was hampered by unusually high water conditions and darkly stained water.

Additional aerial surveys were conducted on streams which have not been subject to long term regular monitoring and consequently are not currently used as indices of abundance. These surveys were conducted by Yukon First Nations through the DFO Aboriginal Fisheries Strategy. All or parts of the following rivers were flown: Morley River, Little Kalzas River, Mica Creek , Jennings River and upper Teslin River. The highest count (230 chinook salmon) was observed on the Morley River.

A limited amount of sampling was conducted at spawning grounds on the Takhini River, Teslin River, and the Little Salmon River. Out of a total of 251 chinook salmon sampled, 147 (59%) were female. This contrasts with an observed sex composition of 28% female (N=194) in 1996.

5.2 Summer Chum Salmon

Preliminary postseason analysis of comparative commercial harvest and escapement data indicate the summer chum salmon run was below average in magnitude. Spawning escapements to selected tributaries showed variable results. Those streams where minimum goals were met or where escapements were considered adequate were the Anvik, Nulato, Chena and Salcha Rivers and Kaltag and Clear Creeks. The East Fork Andreafsky, Gisasa and South Fork Koyukuk Rivers had poor escapements.

A sonar-estimate based goal for summer chum salmon has been established for the Anvik River. Minimum aerial-survey based escapement goals for summer chum salmon have been established in the East and West Fork Andreafsky River, North Fork Nulato River, Clear and Caribou Creeks of the Hogatza-Koyukuk River drainage, and the Salcha River. Because these minimum escapement goals are based on aerial survey index counts, they do not represent the total escapement to the spawning tributary.

The preliminary Anvik River sonar-based escapement estimate of 609,118 summer chum salmon was approximately 22% above the minimum escapement goal of >500,000. The run was smaller than expected based upon parent year escapements of 775,626 in 1992 and 517,409 in 1993. The pooled escapement sample showed five-year-old fish dominant at 54%, and a sex composition of 57% females.

Weir projects were operated by USFWS on the East Fork Andreafsky, Gisasa, and South Fork Koyukuk Rivers. A total of 49,091 summer chum salmon were counted passing through the weir on the East Fork Andreafsky River. This count was 55% below the 1996 weir count and the second lowest escapement recorded from a tower, weir, or sonar project on this stream. The summer chum salmon minimum aerial survey escapement goal for the East Fork Andreafsky River is >109,000. The minimum escapement goal for the West Fork Andreafsky River is >116,000 aerial survey counts. Aerial surveys, however, were not conducted on the Andreafsky River for summer chum salmon in 1997. The weir count indicated the minimum escapement goal for the East Fork Andreafsky River was not met. However, it should be noted that the aerial survey escapement goals for the Andreafsky River may warrant further review and analysis.

A total of 31,802 summer chum salmon were counted passing through the Gisasa River weir. A summer chum salmon escapement goal has not been established for this river. However, the 1997 weir count was 25% of the 1996 weir count and the lowest on record since its inception in 1994. Five-year-olds accounted for 78% of the pooled escapement sample, with 7% 4-year-old and 15% 6-year-old. Female salmon were slightly more numerous than males, accounting for 51% of the sample.

The USFWS operated a weir project on the South Fork of the Koyukuk River for the second year beginning on 6 July. During the period of 6 July through 31 July, 2,582 chum salmon were counted, which was 93% less than the 1996 count of 37,450. Sex ratio sampling indicated 36% females.

Counting-tower projects were operated on Kaltag Creek, Nulato River, Clear Creek, and the Chena and Salcha Rivers. The Kaltag Creek tower project was operated by the City of Kaltag and funded by the Alaska Cooperative 4-H Extension Service and BSFA. TCC operated a counting tower on Clear Creek, a tributary of the Hogatza River within the Koyukuk River drainage.

The estimated summer chum salmon escapement into Kaltag Creek in 1997, 48,018 salmon, was 7% less than the 1996 estimate and 38% less than the 1995 escapement estimate. No escapement goal has been established for Kaltag Creek.

The estimated summer chum salmon escapement into the Nulato River (both forks combined) was 157,975 salmon. Based on this tower count, it is believed the escapement goal was met. An aerial survey of the Nulato River was not conducted due to poor weather conditions. Five-year-old

salmon dominated the escapement samples, accounting for 67% of the total. Approximately 49% of the sample was female.

This was the third year the Clear Creek tower on the Hogatza River was operated. The project made chum and chinook salmon counts and gathered ASL data from 21 June to 19 July. Summer chum salmon passage was estimated at 76,454 fish. The estimated escapement in 1997 was 24% and 35% lower than the escapement levels in 1996 and 1995, respectively. Sex ratio sampling indicated approximately even contributions of male and female salmon.

The Chena River tower count was 9,439 summer chum salmon, which was 26% below the 1996 count of 12,810, but similar to the average count of 9,182 for the years 1993, 1994 and 1995. High, turbid water hampered operations on the Salcha River tower at times during the 1997 season. The Salcha River tower count of 35,741 summer chum salmon was about half of the 1996 count of 74,827 fish, but similar to the average count of 36,287 for the previous four years. Aerial surveys conducted on both rivers were either done too early in the season or under poor weather conditions. A total of 210 summer chum was observed on a Chena River survey conducted on 18 July which was rated poor for summer chum salmon because it was conducted prior to peak spawning. On 11 August a second survey was flown under poor conditions and 587 summer chum were observed. A Salcha River survey was flown on 1 August under poor survey conditions and 3,968 summer chum were observed. The Salcha River aerial survey was 13% above the minimum aerial survey escapement goal of >3,500 summer chum salmon.

A weir operated on Beaver Creek by BLM recorded a passage of 34 summer chum salmon which was only 5% of the 1996 count of 654 summer chum salmon. Maximum passage rates were between 26 July and 4 August.

5.3 Fall Chum Salmon

5.3.1 Alaska

Given that a final assessment of overall run size and spawner distribution is not yet available, preliminary indications are that the 1997 Yukon River fall chum salmon run was below the preseason projection of 750,000 fish. The preliminary sonar passage estimate at Pilot Station was 622,000 ± 25,500 (90% C.I.) fall chum salmon. This passage estimate, together with estimated commercial and anticipated subsistence harvests below the sonar site, results in a total fall chum salmon run size estimate of between approximately 650,000 and 700,000 fish for 1997. A review of upper river test fishing data and escapement information suggests that the non-Tanana River run component, although not as strong as in 1995 and 1996, was comparatively much stronger than the Tanana River run component in 1997.

Preliminary results from a second-year, USFWS feasibility mark-recapture study near Rampart indicate the 1997 upper Yukon River fall chum salmon run component was approximately 40% lower than that estimated in 1996. Even so, fall chum salmon escapements in Alaskan tributary streams of the upper river were good, based upon observations made in the Chandalar and Sheenjek Rivers. The preliminary fall chum salmon escapement estimate for the Chandalar River was approximately 200,200 fish, similar in magnitude to the large escapement estimates made in that stream in 1995 and 1996. Although sonar operations were suspended in the Sheenjek River for five to six days due to high water which prevailed in late August and early September 1997, total escapement was conservatively estimated to have exceeded 80,000 fish, indicating that the minimum escapement goal (64,000 fish) was achieved.

Comparatively, the Tanana River fall chum salmon run component was weak in 1997 based upon test fishery results from the south bank Yukon River near Tanana as well as those in the Tanana River. Fall chum salmon spawning ground surveys are currently being conducted at selected locations throughout the Tanana River drainage. An intensive ground surveillance of the Toklat River spawning area in 1997 has provided a preliminary estimate of 14,511 fall chum salmon spawners, which is well below the minimum goal of 33,000 fish.

For the upper Tanana River (upstream of the Kantishna River), a preliminary total abundance estimate, from a mark-recapture project, of the number of chum salmon which passed the tagging site through 30 September is approximately 41,000 fish using a simple non-stratified estimator. However, diagnostic data analyses are still being conducted and it is anticipated that the final abundance estimate (using temporal stratification) is likely to increase by 20,000 to 30,000 chum salmon. This would still indicate that run size to this portion of the drainage was likely no more than approximately 50% of that estimated in 1996 (135,000) or 25% of that estimated in 1995 (268,000).

Intensive ground surveillance of the Delta River spawning area was initiated in late September 1997 and surveys will continue weekly throughout October and November. The highest count thus far (24 October) has amounted to only 5,271 fall chum salmon, and it is not yet known whether or not the minimum escapement goal of 11,000 fish will be achieved. Final assessment of Tanana River fall chum salmon escapements will not be available prior to the end of November.

5.3.2 Canada

The preliminary mark-recapture estimate of the total chum salmon spawning escapement for the Canadian portion of the upper Yukon drainage is 85,635 chum salmon. This is 16% below the 1993-1996 average of 102,156 chum salmon. Results of the DFO tagging programme are discussed in greater detail in Section 6.2.2 of this report.

Chum salmon aerial surveys were conducted on the Kluane River, the mainstem Yukon River and the Teslin River. The survey dates were 20 October, 18 October and 28 October respectively. Historical data are presented in Attachment I.

The Kluane River count of 3,350 chum salmon was 71% below the 1993-1996 average. The mainstem Yukon River count of 2,189 chum salmon was 37% below the recent cycle average. The 1994 mainstem Yukon River count is excluded from the cycle average because of poor fish countability. Visibility for the Kluane River survey was good; the mainstem Yukon River survey was only fair because of a significant amount of ice and snow coverage. The 1997 Teslin River index count of 207 chum salmon was 49% below the recent cycle average (with 1994 excluded due to poor viewing conditions). The fish countability in 1997 was rated as good.

In the Porcupine River drainage, the Fishing Branch River weir count of 26,959 chum salmon was below the lower end of the interim escapement goal, which is 50,000 to 120,000 chum salmon. Female fish comprised 52% of the count. Details are presented in Section 6.2.6.

Sampling for age/length, sex was conducted on post-spawn chum salmon on the Kluane River, the mainstem Yukon River, and the Teslin River. The sampling project was implemented by the Yukon Commercial Fishers Association using R&E funds. Ninety-five percent of the 457 samples taken were from dead fish and 45% of the sample consisted of females.

5.4 Coho Salmon

Coho salmon escapement assessment is very limited in the Yukon River drainage due to funding limitations and survey conditions generally encountered during periods of peak coho salmon spawning activity. Most of the escapement information that has been collected on coho salmon is from the Tanana River drainage. The only escapement goal established is for the Delta Clearwater River (DCR), which has a minimum goal of 9,000 fish. This goal is based on the number of coho salmon observed from a boat survey of the DCR index area during peak spawning activity, which occurs in late October. The 1997 DCR coho salmon escapement estimate on 24 October was 11,525 fish. Additional surveys are conducted by TCC in the Nenana River drainage with BSFA funding.

Through a cooperative agreement between the USFWS and BSFA, 1997 marked the third consecutive year that East Fork Andreafsky weir operations were extended into September to collect coho salmon escapement data. Normally, timing of the weir operation is planned to count chinook and summer chum salmon, terminating in late July or early August. A total of 9,462 coho salmon were passed through 13 September, the last day of operation in 1997. This compares to 8,037 coho salmon counted past the weir through 16 September in 1996 and 10,901 through 12 September in 1995.

The USFWS also operated a weir in the South Fork Koyukuk River for the second consecutive year in 1997 to monitor salmon escapements. Although 8,551 chum and no coho salmon were counted past the weir during the first two weeks of August, operations were suspended for nearly the remainder of the season due to high water conditions. The weir was only in operation three and one-half additional days in late August (24th-27th), and a total of 2,685 chum and no coho salmon were passed during that period.

6.0 PROJECT SUMMARIES

6.1 Alaska

In addition to projects operated and funded by state and federal agencies, several fishery-related projects were conducted by local organizations within the Yukon River drainage, funded from a U.S. congressional appropriation through the Bureau of Indian Affairs (BIA). A list of all projects conducted within the Alaskan portion of the Yukon River drainage, including project location, objectives, and responsible agencies or organizations, is provided in Table 4. Results from most projects are incorporated in the fishery and stock status portions of this report. Historic project results can be found in the attached database tables and figures. Because of the relatively large number of projects conducted within the Alaskan portion of the drainage, only new projects, or projects of particular interest, are presented in detail here. These specific projects are: (1) Yukon River (Alaskan portion) comprehensive salmon planning, conducted by ADF&G and the Yukon River Drainage Fisheries Association (YRDFA); (2) Yukon River salmon stock identification research, conducted by ADF&G, USFWS, and the United States Geological Survey-Biological Resources Division (USGS-BRD); (3) Yukon River sonar, conducted by ADF&G with assistance from AVCP; (4) South Fork Koyukuk River weir, conducted by USFWS; (5) Beaver Creek weir, conducted by the United States Department of the Interior, Bureau of Land Management (BLM); (6) Chandalar River sonar, conducted by USFWS; (7) Tanana River fall chum salmon tagging project, conducted by ADF&G and BSFA; (8) Yukon River fall chum salmon ecology studies, conducted by USGS-BRD; (9) Toklat River fall chum salmon radio telemetry feasibility study conducted by ADF&G; and (10) Toklat River fall chum salmon restoration study, conducted by ADF&G.

6.1.1 Yukon River (Alaskan Portion) Comprehensive Salmon Plan

ADF&G is in the process of developing a Yukon River comprehensive salmon plan for the U.S. portion of the Yukon River drainage. This is a process involving user groups, various government agencies, and other interested parties with the goal of developing a comprehensive plan for the U.S. portion of the Yukon River drainage. The intent of the plan is to define goals and objectives, provide reference information on the stocks and fisheries, identify potential restoration and enhancement opportunities and concerns, recommend appropriate procedures, and

evaluate priorities. ADF&G has entered into a cooperative agreement with YRDFA on the planning process. A second working draft was distributed in October of 1997 and the plan is scheduled to be completed in the summer of 1998.

6.1.2 Yukon River Salmon Stock Identification

A combined analysis using scale patterns, age composition estimates, and geographic distribution of catches is used by ADF&G on an annual basis to estimate the stock composition of chinook salmon in Yukon River fishery harvests. Three region-of-origin run groupings of chinook salmon, or runs, have been identified within the Yukon River drainage. The lower and middle run stocks spawn in the Alaska portion of the drainage, and the upper run stock spawns in the Canadian portion of the drainage.

Scale pattern analysis (SPA) is used to apportion the major age group(s) of the District 1, 2, 3, and 4 chinook salmon harvest to region of origin, or stock. The minor age groups in these harvests are apportioned to run based on presence of those age classes in the run-specific escapement relative to the other run-specific escapements. The District 5 harvest, as well as the Canadian harvest, are apportioned entirely to the upper run stock based on geographical location of the harvest. Likewise, the District 6 harvest is apportioned to the middle run stock also based on geography.

During 1996, stock standards for the lower river run were obtained from chinook salmon escapements to the Andreafsky, Anvik and Gisasa Rivers. Middle river stock standards were obtained from chinook salmon escapements to the Chena and Salcha Rivers of the Tanana River drainage. DFO contributed scale samples from tagging project fish wheels and from the commercial fishery in Canada for use as the standard for the upper run stock. Data have not yet been analyzed for 1997. The results presented below for 1996 are still considered to be preliminary. Prior year analyses have provided the following estimates of stock composition for the total Yukon River drainage chinook salmon harvest (commercial and non-commercial harvests in Alaska and Canada combined):

Year	Lower Run Stock	Middle Run Stock	Upper Run Stock
1982	15%	23%	62%
1983	12%	39%	49%
1984	29%	36%	35%
1985	31%	20%	49%
1986	26%	6%	68%
1987	17%	19%	64%
1988	27%	12%	61%
1989	26%	16%	58%
1990	19%	22%	59%
1991	26%	28%	46%
1992	18%	23%	59%
1993	22%	13%	65%
1994	16%	24%	60%
1995	12%	13%	75%
1996	31%	7%	62%

During the 1997 field season, no new genetic stock identification (GSI) samples were collected by ADF&G. Genetics staff focused on report writing. Genetics staff from ADF&G, USFWS, and USGS-BRD worked closely with other members of the Subcommittee on Stock Identification on a report that summarizes the status and capabilities of stock identification techniques for chum salmon and chinook salmon in the Yukon River. The report reviews scale pattern analysis, genetic stock identification, coded-wire tagging, and radio telemetry studies. It compares the utility of these stock identification techniques, and makes recommendations for the immediate and future use of these techniques to resolve current management issues. In addition, a manuscript was finalized and submitted to Canadian Journal of Fisheries and Aquatic Sciences. This manuscript summarizes the results of the collaborative ADF&G, USFWS, and USGS-BRD project examining the utility of DNA markers to separate fall-run chum salmon in the Yukon River. The manuscript is titled; *Genetic differentiation of US and Canadian stocks of fall-run chum salmon from the Yukon drainage: Concordance of GSI results among protein and DNA marker classes and tests of assumptions underlying assignment and weighting of reporting groups*, by Scribner, K.T., P.A. Crane, W.J. Spearman, and L.W. Seeb.

6.1.3 Yukon River Sonar

The goal of the Yukon River sonar project at Pilot Station is to estimate the daily upstream passage of chinook, summer chum, and fall chum salmon. The project has been conducted annually since 1986, except for 1992 when the project was operated for experimental purposes, and 1996 when it was operated for training purposes only. Sonar equipment is used to estimate total fish passage, and drift gill netting with a variety of mesh sizes is used to estimate species composition. Prior to 1992, we used sonar equipment which operated at 420 kHz. We now know that those estimates were perturbed by the effect of uncompensated signal attenuation on acoustic

beam shape and reduced effective range. In 1993, we changed our existing sonar equipment to operate at a frequency of 120 kHz to allow greater ensonification range and to minimize signal loss. The newly configured equipment was field tested in 1993 using standard acoustic targets and was verified to perform very well. Use of lower frequency equipment substantially increased our ability to detect fish at long range.

Since project inception, we have attempted to classify detected targets as to direction of travel by aiming the acoustic beam at an upstream or downstream angle relative to fish travel. This technique compromised fish detection to an unknown degree and was discontinued after 1994. Significant enhancements in 1995 included further refinements to the species apportionment process and implementing an aiming strategy designed to maximize fish detection. Because of these recent changes in methodology, abundance data collected prior to 1995 are not directly comparable to data collected beginning in 1995. However, data collected prior to 1995 remain useful as an historic reference for run timing information.

Salmon passage estimates at Pilot Station are based upon a sampling design in which sonar equipment is typically operated in 3-hour intervals, three times each day (0530-0830, 1330-1630, and 2130-2430). On four occasions in 1997 the sonar equipment was operated 24 hours per day. The resulting 24-hour passage estimates were 3% to 16% lower than expanded 9-hour passage estimates, which is similar to comparisons obtained in prior years. The tendency of 24-hour estimates to be somewhat less than expanded 9-hour estimates is thought to reflect disruptions to migratory behavior caused by species apportionment gill netting activities in the ensonified water column during sonar data acquisition.

Gill nets with mesh sizes ranging from 7.0 cm to 21.6 cm (2.75 in to 8.5 in) were drifted through the sonar sampling areas twice daily between the sonar data collection periods. Total catch for the 1997 field season was 6,600 fish, including 469 chinook salmon, 3,350 summer chum salmon, 1,581 fall chum salmon, 488 coho salmon, 1 sockeye salmon, 10 pink salmon, and 701 non-salmon species. Captured fish were distributed to nearby residents daily.

The sonar project was operational from 6 June through 31 August in 1997. During the field season we detected and measured acoustic signal loss during a series of high water events which peaked on 3 and 30 June, and 18 August. We believe the signal loss was caused by sediment load, and feel that we were able to compensate for signal loss during most of this time. In addition, a heavy debris load during the end of June forced us to remove all sonar equipment from the water for 2 ½ days. At this time, we have no plans to estimate the missing data during those times.

Preliminary passage estimates for 1995 and 1997 are listed below:

Year	Chinook	Summer Chum	Fall Chum	Coho[a]	Other Fish[b]
95	240,000	3,638,000	1,248,000	154,000	594,000
97[c]	222,000	1,402,000	622,000	152,000	273,000

[a] Passage estimates for coho salmon are incomplete. The sonar project is terminated prior to the end of the coho salmon run.

[b] "Other Fish" may include pink salmon (which are substantially more abundant in even-numbered years), whitefish, sheefish, northern pike, and other species. These estimates are not total passage estimates but are merely expanded estimates of the number of fish in the acoustic beam.

[c] Passage estimates do not include lost sampling days.

6.1.4 South Fork Koyukuk River Weir

A resistance board weir was installed by USFWS on the South Fork of the Koyukuk River, about 32 km above the confluence with the mainstem Koyukuk River and 2 km above Fish Creek. This was the second year of this escapement study. The weir was in operation from 6 July through 11 September; however, due to high flows that submerged the weir panels and trap, after 15 August there were only four days, 24-27 August, when the weir was operable. A total of 1,642 chinook salmon were counted, and fish were present at the site on the first day of operation. A number of salmon were obviously missed during the high water events. The female-male ratio was 62% female, compared to 31% in 1996. Summer chum escapement totaled 11,237 fish. When counting was resumed after the high-water interruption, chum salmon passing through the weir were assumed to be the fall component. A total of 2,685 fall chums were counted after 15 August. Chum salmon were sampled weekly (140 fish/week) for length, sex, and age information, however that data has not yet been summarized.

6.1.5 Beaver Creek Weir

In 1997, the U.S. Department of the Interior, Bureau of Land Management (BLM) set up a weir to estimate passage of salmon into the upper portion of the Beaver Creek drainage, tributary of the Yukon River downstream of Fort Yukon at approximately RM 950. The project was located approximately 200 river miles upriver of the Yukon River and 5.5 river miles above the confluence of Victoria Creek. Fish counts started on 14 June and continued through 11 August.

In 1997, sampling of scales, sex ratios, length and weights was conducted. Peak passage of chinook salmon was from 19 July through 26 July. Only 34 summer chum salmon were counted through the weir in 1997, which was only 5% of the count of 654 in 1996. It is anticipated that the project will run annually through the year 2000.

6.1.6 Chandalar River Sonar

Due to the importance of Chandalar River (RM 996) fall chum salmon as a refuge and subsistence resource, a five-year sonar study was initiated in 1994 to reassess the population status using split-beam hydroacoustics. The initial year, 1994, was used to develop site-specific operational methods, evaluate site characteristics, and describe possible data collection biases. In 1995, a post-season estimate of 280,999 upstream swimming chum salmon passed the site and in situ target strength evaluations were completed. During the 1996 season, daily in-season counts were generated, with a post-season estimate of 208,170 chum salmon. In 1997, the preliminary escapement estimate was 200,173, with a 95% C.I. of ±5,546 chum salmon. The project was run continuously (24 h/d) from 8 August through 22 September, except for 11 days of down time on the right bank due to high water. The ratio estimator method and associated variance were used to predict the missing right bank counts from left bank data for this time period. All acquired targets were manually tracked from the raw acoustic data and electronically written to file. Upstream fish were separated from downstream targets. Chart recordings and tracked data were compared daily to insure that the digital processor filters did not affect target acquisition. Detailed acoustic analyses and a post-season total escapement estimate will be completed this winter and a progress report provided by June 1998.

6.1.7 Tanana River Fall Chum Salmon Tagging

A cooperative fall chum salmon stock assessment project by ADF&G and BSFA was conducted on the Tanana River for the third consecutive year in 1997. The primary objective of the study was to determine the feasibility of estimating the abundance of fall chum salmon in the Tanana River upstream of the Kantishna River using mark and recapture techniques. Secondary objectives were to estimate the migration rates of fall chum salmon within the Tanana River and determine the timing of selected stocks (e.g., the Delta River) as they pass the tagging site. The feasibility of continuing the project on an annual basis for use as a reliable inseason management indicator of Tanana River fall chum salmon run strength and timing will also be evaluated.

A single fish wheel was operated in the Tanana River approximately 6 km above the mouth of the Kantishna River to capture chum salmon for tagging. The wheel was equipped with a live box and a three-person crew tagged chum salmon during a 12-hour daily deployment schedule. Chum salmon were tagged with individually numbered spaghetti tags and each tagged fish had its right

pectoral fin clipped as a secondary mark. A total of 1,284 chum salmon were tagged and released from 16 August through 30 September.

Two additional fish wheels, which operated approximately 76 km upstream of the tagging wheel were used to recapture tagged chum salmon. The two recovery wheels, each equipped with a live box, were fished 24 hours per day on opposite sides of the river and within 2 km of each other. A total of 104 tags were recovered from 3,898 chum salmon examined in the recovery wheels during the period 16 August through 4 October. Additional recoveries of tagged chum salmon were voluntarily made by commercial and subsistence fishermen, as encouraged by a $200 lottery. Tag recoveries are also being made at this time from spawning ground surveys to provide stock specific run timing information where possible.

A preliminary total abundance estimate of the number of chum salmon which passed the tagging site through 30 September is approximately 41,000 fish using a simple non-stratified estimator. However, diagnostic data analyses are still being conducted and it is anticipated that the final abundance estimate (using temporal stratification) is likely to increase by 20,000 to 30,000 chum salmon. This would still indicate that run size to this portion of the drainage was likely no more than approximately 50% of that estimated in 1996 (135,000) or 25% of that estimated in 1995 (268,000).

6.1.8 Yukon River Chum Salmon Ecology Studies

Significant progress was made over the last year in research designed to determine chum salmon survival rates, and the factors influencing those rates, in several Yukon River tributaries by the USGS-BRD. Study sites have been established and monitored on Hodgin's Slough of the Chena River (summer chum) and Bluff Cabin Slough of the Tanana River (fall chum) for both the 1996 and 1997 spawning seasons. Numbers of spawners, egg deposition, pre-emergent fry densities, and downstream fry abundance and migration patterns were monitored at both sites in late winter and spring of 1997. A study site was also established on a spawning slough of the Salcha River, but extreme ice precluded worthwhile sampling in the spring, so that site has been abandoned. Alternative Salcha River sites were identified during the summer of 1997. An initial visit was made to the Toklat River this fall. It is hoped that sufficient funding will be identified for Fiscal Year 1998 so that additional intensive study sites can be established on the Salcha and Toklat rivers, raising the number of study sites to four as originally indicated in the Study Plan. During this research on survival rates, there have also been opportunities to collect information on spawner behavior, sex ratios, age composition, spawner duration on the spawning area, and the effectiveness of foot surveys.

Extensive surveys of spawners in the Chena and Salcha rivers and Bluff Cabin Slough were completed in 1996 and 1997 to help us understand how best to extend study results from

intensive sites to the remainder of the spawners. Progress reports on the USGS-BRD studies are planned to be completed in spring, 1998.

6.1.9 Toklat River Fall Chum Salmon Radio Telemetry Feasibility Study

From 1980 through 1989, Toklat River ground survey escapement estimates were consistently less than the Biological Escapement Goal (BEG) of greater than 33,000 fall chum salmon, despite numerous management actions that were taken to protect Toklat River fall chum salmon stocks. Because of the concern for those stocks, ADF&G initiated a sonar feasibility study in 1994 with the expectation that the managers would be provided with a reliable estimate of fall chum salmon escapement to the Toklat River index area. Intensive ground surveys were continued, providing for historical consistency until the sonar estimates could be evaluated. The preliminary sonar passage estimate and the chum salmon ground survey population estimate in 1994 were very similar (73,000 versus 74,000 respectively). In 1995, however, the sonar passage estimate was approximately twice the ground survey population estimate (128,000 versus 55,000 respectively), and in 1996, sonar passage estimate of 89,000 fish was approximately 4.6 times greater than the ground survey estimate of 19,000 fish. In order to attempt to address the discrepancy between the sonar and ground survey estimates, in 1997 ADF&G conducted a feasibility study utilizing radio telemetry. Analysis of the data is underway at this time. It is hoped that information from this study will help evaluate current assumptions, and assist in understanding Toklat River fall chum salmon spawning characteristics.

6.1.10 Toklat River Fall Chum Salmon Restoration Study

Fall chum salmon restoration activities began within the Toklat River springs spawning area in 1992. This pilot project was precipitated by the Toklat River having only reached its escapement objective of greater than 33,000 spawners once (in 1990) in the previous 12-year period of 1980 through 1991. From 1992 to 1995, fall chum salmon eggs were collected from a small sample of Toklat River fall chum salmon, reared at Clear Hatchery. Nearly all of the surviving fry were tagged with coded wire tags and released within the Toklat River springs spawning area each following spring. In 1996 ADF&G began the evaluation phase of this pilot study. The recovery of tagged adult fish, and a four-component recovery program was initiated. The first component was to evaluate the proportion of the Toklat River fall chum salmon return consisting of hatchery-reared fish. Components two and three were to evaluate the contribution and timing of Toklat River fall chum salmon in the proximal fisheries, and the fourth component was to evaluate the homing of Toklat River fall chum salmon within the Toklat River springs spawning ground area.

With the assistance of ADF&G, TCC has continued to investigate the quality of spawning habitat on the Toklat River spawning grounds. This project was initiated in 1994 by BSFA and continues

with their funding support. Preliminary data indicate adequate to good intra-gravel water temperatures within the incubation environment for each of three habitat types being studied. A progress report has been prepared describing methods, results, and conclusions for information collected during 1994-1996 (Headlee, 1997).

6.2 Canada

6.2.1 Upper Yukon River Salmon Test Fishing (Yukon Territory)

DFO has collected run timing and relative abundance data for chinook and chum salmon using fishwheels situated near the Canada/U.S. border since 1982 (excluding 1984). Consistency in the fishwheel sites and fishing methods permits some inter-annual and in-season comparisons, although the primary purpose of the fishwheels is to live-capture salmon for the mark-recapture programme. Catch data is used cautiously when assessing abundance since there is limited correlation with mark-recapture estimates of border escapement, particularly with chinook salmon. Test fishing results are presented in this section and are also referred to in Section 3.0.

The two fishwheels, White Rock and Sheep Rock are situated approximately seven kilometres apart on the north bank of the river. With the exception of short periods for maintenance or repair, both fishwheels ran 24 hours per day, for a cumulative of 3,922 hours, from 19 June to 9 October inclusive. The first chinook salmon was caught in the downstream fishwheel, White Rock, on 26 June. On average during the last ten years the first chinook salmon has been caught on June 28. There were three distinct peaks observed over the course of the run. Using the combined catch, the first peak (112 fish) occurred on 12 July; the second and major peak (227 fish) occurred on 26 July; and the final peak (107 fish) was observed on 4 August. The mid-point of the run was observed on 27 July, slightly later than the average mid-point during the previous ten years, 22 July.

The combined total fishwheel catch of chinook salmon in 1997 was 2,221 fish, 54% above the 1987-96 average, and 32% above the recent cycle average. The sex composition as observed in the fishwheel catches was 40% female. This is somewhat higher than the annual proportion of females averaged over the years 1987 through 1996 (32% female). Note that existing information suggests that chinook salmon sex ratio estimates based on fishwheel harvests may be biased in favor of males because of differential capture probabilities between sexes.

The exceptionally early pulse of chum salmon observed in the fishwheels 1996 did not occur in 1997. In 1997, the first chum salmon was caught on 23 July. The run mid-point occurred on 16 September; the mid-point dates over the previous ten years average at 12 September, although they are quite variable (range 5 September to 21 September). The peak catch (155 chum salmon) occurred on 18 September. Run pulses were not as pronounced as they have been in some years. The total catch was 3,571 chum salmon which is 2% above the long-term average and 27% below

the recent cycle average (4,919 chum salmon).

6.2.2 Upper Yukon River Tagging Program (Yukon Territory)

DFO has conducted a tagging programme on salmon stocks in the Canadian section of the upper Yukon River drainage since 1982 (excluding 1984). The objectives of the programme are to provide inseason estimates of the upper Yukon border escapement of chinook and chum salmon for management purposes and to provide postseason estimates of the total spawning escapements, harvest rates, migration rates and run timing. Spaghetti tags are applied to salmon live-captured in the fishwheels. Tagging events are twice daily, morning and evening. Subsequent tag recoveries are made in the different fisheries located upstream, and infrequently in those located downstream. Reports of downstream recoveries are generally received post-season. From the 1996 season, two chinook salmon and eight chum salmon tag recoveries have been reported from Alaska (comprising 0.1% of and 0.2% of those applied respectively). Population estimates are developed using spaghetti tag recoveries from the Canadian commercial fishery downstream from the Stewart River where the most intensive weekly/daily catch monitoring is conducted. In this area, commercial fishers are legally required to report catches and deposit tags and associated data in drop-off boxes at the Fortymile River or in Dawson City, within eight hours of the closure of each fishery. The preliminary 1997 estimates for both chinook and chum salmon were developed using the Petersen method, pooling sexes, length classes and all temporal strata. It was assumed that 10% of tags are unavailable for recapture in the study area due to tag loss or drop-out of fish. This methodology is consistent with that used in previous years.

Preliminary results indicate that spaghetti tags were applied to 2,210 chinook salmon. Downstream of the Stewart River, 5,006 chinook salmon were harvested, 185 of which had DFO spaghetti tags.

The preliminary 1997 chinook salmon border escapement estimate is 53,400 fish (95% confidence interval = 46,272 to 61,619). Approximately 37,796 chinook salmon are estimated to have reached the various spawning grounds. This exceeded the escapement goal of 28,000 established by the Yukon Panel in 1996 by 35% and was within the rebuilt escapement goal of 33,000 to 43,000 chinook salmon. Comparative border and spawning escapement estimates from the tagging programme for 1982 through 1997 are presented in Attachment Table 10.

The number of chum salmon tagged in White Rock and Sheep Rock fishwheels in 1997 was 3,522. The tag recapture component of the mark-recapture study for chum salmon involved both live-capture fishwheels and the commercial fishery (which involved both gillnets and fishwheels). The live capture project, conducted by the Yukon Commercial Fishers Association and funded by the R&E Fund, operated during statistical weeks 35 to 37 (beginning August 23 and ending September 13) for four days each week., and in statistical weeks 38 and 39 (ending 27 September) for two days each week. The project involved the use of four fishwheels; two on

opposite banks near Fortymile, and two at Moosehide, near Dawson City (one of which was moved to the Chandindu River during the latter part of the project). Fish captured in the Fortymile fishwheels were marked with a leather punch on the upper or lower portions of the caudal fin to avoid multiple counting. Fish captured in the fishwheel near the Chandindu River were also marked, on the dorsal fin. In the live-capture project, a total of 6,656 chum was caught; 243 of these were known recaptures. Recaptured fish were excluded from the mark-recapture estimate and the total number of unmarked fish caught was adjusted to account for potential recaptures of unmarked fish, by assuming that the proportion of recaptured unmarked fish was the same as that for the tagged sample. The number of DFO tags observed (228) was adjusted for the population estimate to 219 tags using the above ratio.

The commercial fishery was opened based on run assessments from the live-capture fishwheels from 14 September to 9 October for two days during each of the first two weeks and four days for each of the latter weeks. It was also open the following week for three days, however the river was icing at this time and no fishing was conducted. Downstream of the Stewart River, a harvest of 7,731 chum salmon was reported; this harvest included 445 fish with DFO spaghetti tags.

The information from the live-capture and commercial fisheries was pooled, providing a preliminary chum salmon population estimate of 94,725 fish (95% confidence interval = 86,342 to 103,920). Approximately 85,635 of these fish are estimated to have reached the various spawning grounds, a number that meets the rebuilding goal of more than 80,000 chum salmon as recommended by the JTC. Comparative border and spawning escapement estimates from the tagging programme for 1982 through 1997 are presented in Attachment Table 12.

6.2.3 Harvest Sampling

The Canadian commercial chinook salmon harvest was sampled in 1997 for age, length, sex and coded-wire tag (CWT) data, and spaghetti tag loss data. Chum salmon commercial harvest were not sampled this year due in part to funding constraints. Age/length/sex data were taken from approximately 1,200 chinook salmon over the course of the fishery. The unweighted sex composition observed in the chinook sample was 43% female. This compares with unweighted sex compositions of 38% female in 1996 and 48% female in 1995. Four hundred and fifteen fish caught approximately 20 kilometres upstream of the tagging area were examined for tagging marks. None were observed on fish lacking tags. Fifteen adipose-clipped fish were observed out of 1,392 examined. The heads from adipose-clipped fish were retained for CWT retrieval.

Age, length, and sex samples were also obtained from the Aboriginal harvest by LGL consultants as a corollary to the Aboriginal harvest study.

The Tatchun Creek chinook sport fishery was sampled in 1997 as part of the Tatchun Creek area

chinook salmon enumeration project funded by the R&E fund. Age, length and sex data was obtained from 129 harvested chinook salmon. Of these fish, 29% were female.

6.2.4 Whitehorse Rapids Fishway Chinook Enumeration

A total of 2,084 chinook salmon ascended the Whitehorse Fishway in 1997. This count agrees closely with that of 1995 (2,102 chinook salmon) which is the second highest on record. The percent female was 51% (1,065 fish), which is above the 1991-1996 average of 37%. (Note: 1991 through 1994 percentages do not include adipose-clipped fish due to reasons outlined below). The adipose-clipped component was small relative to the total run size in 1997. It accounted for 10% of the run and consisted of 141 males and 60 females. These adipose-clipped counts were expanded by the marked to not-marked release ratios using the age composition of adipose-clipped fish (sexes treated separately) observed in 1996. These preliminary calculations indicated a hatchery run contribution of 24%. Final estimates will be generated after the CWT's obtained from fish sampled at the fishway are decoded.

As has been observed since 1994, a number of chinook ascended the fishway more than once. CWT results from 1994, 1995 and 1996 indicate that the fish that exhibited this behaviour had been released into the fishway as fry, after rearing in the hatchery. The fishway was first used as a release site for adipose-clipped hatchery fry in 1989; hence, it is possible that the number of adipose-clipped fish may be exaggerated somewhat in annual counts beginning in 1991, when the first three-year-olds would have returned. Adjustments have not been made to 1991 - 1994 adipose-clip tallies. Starting in 1995, all adipose-clipped chinook salmon ascending the fishway were marked with a caudal punch in order to eliminate the possibility of multiple-counting. In 1997, approximately 13% of the marked fish re-ascended the fishway.

Of the fish which ascended the fishway more than once in 1997, 3 males were sacrificed for CWT's. In addition to these fish and the fish taken for broodstock (see section 6.2.6), a random CWT sample was removed from the fishway; this comprised 50 adipose-clipped males and 18 adipose-clipped females. The purpose of the random CWT sample was to evaluate the effect of release strategy on return rates, and to estimate run composition, including the overall hatchery component. As well as the fish removed for the above reasons, there were at least 116 mortalities (11 males and 105 females) in the fishway itself.

The run mid-point occurred on 16 August, two days later than the recent cycle average (14 August) run mid-point. The peak count (165 fish) was made on 16 August and the first fish arrived on 25 July. On average during the previous chinook cycle, the run peaked on 14 August and the first fish ascended the fishway on 26 July.

6.2.5 Wolf Creek Chinook Salmon Weir

An enumeration weir was operated on Wolf Creek for the third consecutive year by the Yukon Fish and Game Association. Wolf Creek is situated approximately 10 kilometres upstream of the Whitehorse Fishway and the Whitehorse hydroelectric dam. Anecdotal information indicates that the creek was used by chinook salmon for spawning until the mid-1970's. For the purpose of restoring the run, chinook salmon fry from the Whitehorse Hatchery have been released into the creek since 1985. Prior to 1995, adult returns were enumerated using foot surveys. In 1995 and 1996, 242 and 92 adult chinook salmon respectively were counted through the weir. The 1997 count was 61 chinook salmon, of which twenty-one (34%) were females. The number of adipose-clipped fish was 40 (66% of total). Fifteen of the adipose-clipped fish were female. Based on average age compositions observed for hatchery fish, the principal hatchery releases contributing to the Wolf Creek run would have occurred from 1992 to 1994. Approximately 50,000 fry were placed into Wolf Creek in each of these years. Beginning in 1991 all fry released into this location have been tagged. Each year prior to this, with the exception of 1987, none of the releases were tagged. Based on this information, it is likely that each non-adipose-clipped fish was either a seven -year old hatchery fish or the progeny of Wolf Creek spawners.

6.2.6 Whitehorse Hatchery Operations

From approximately 315,000 chinook salmon fry on hand at the Whitehorse Hatchery in May 1997, 312,000 fry were coded-wire tagged and released into the Yukon River system upstream of Whitehorse. The remaining 2,500 fry, deemed unsuitable for tagging, were released into Scout Lake, which is a pothole lake a short distance west Whitehorse. The fry releases into the Yukon River system were as follows: 45,000 into Wolf Creek; 171,000 into Michie Creek; 45,000 into Judas Creek, a Marsh Lake tributary and 50,000 into the McClintock River above the confluence of Michie Creek. The Michie Creek fry were released into three sites; upstream of Michie Lake, at the outlet of Michie Lake and in Byng Creek.

In 1997, broodstock collection began after 300 salmon had migrated up the Whitehorse Fishway. Two males for every female were collected in order to perform matrix spawning, with a view to increasing genetic diversity of offspring. Males were used only once and then sacrificed in order to prevent duplication with other females. The number of females taken from the run was 75; all but three of these were spawned successfully. All males and females were transported to the hatchery in a live-tank and held in Capilano troughs under tarpaulins until they were ripe enough for spawning. An estimated 389,000 green eggs were taken between 17 August and 2 September. The fertilization rate was estimated to be 98%. Shocking and first pick were completed on October 22. As of 1 November, hatching has just commenced. An estimated 304,000 eyed eggs\alevins are currently on hand at the hatchery.

6.2.7 Fishing Branch River Chum Salmon Weir

A weir to enumerate chum salmon escapement to the Fishing Branch River has operated annually since 1985, except for 1990. Prior to 1985, the weir operated during the 1972-1975 period. Since 1991 the weir program has been conducted cooperatively by the Vuntut Gwitchin First Nation, of Old Crow, and DFO. Escapement estimates, including aerial count expansions, have ranged from approximately 16,000 in 1973 to 353,000 in 1975 (Attachment Table 12).

The weir was operational from 28 August until 15 October. Initial counts were poor, however they improved to about 15% below average by September 15. Unfortunately, the run strength was not sustained, declining to significantly below average after this period. The peak count (1,490 chum salmon) occurred on 11 September and the run mid-point was observed on 17 September. These dates are early compared to recent cycle averages of 16 September and 19 September respectively. Despite a forecast for a run above average in magnitude; the cumulative escapement count through the weir was 26,959 fall chum salmon. This was 52% below the recent cycle average of 55,809 and 46% below the lower end of the interim escapement goal range of 50,000 - 120,000 chum salmon.

Generally a small number of chinook and coho salmon are observed at the weir each year. However, the weir is not in place early or late enough to obtain quantitative information on the chinook salmon or coho salmon runs, respectively. In 1997, twelve chinook salmon and eight coho salmon were counted passing the weir site.

6.2.8 Upper Yukon DNA Sampling

Due to the desire to gain more information on specific upper Yukon stocks, the Yukon Salmon Committee (YSC) funded a DNA collection program on chinook spawning stocks in 1997. The impetus for the program arose from previous analyses of the two week delay in the opening of the commercial chinook fishery. This delay was implemented in the late 1980's due to conservation concerns over some distant headwater stocks (e.g. upper Pelly). In an analysis of the impacts/benefits of the delay to stocks of concern, the timing of specific stocks migrating through the commercial fishery could not be demonstrated conclusively. This emphasized the need to develop a stock identification database for chinook salmon that could be used in the future to address similar concerns. As well, the YSC was interested in developing an archive of the genetic traits of Canadian-origin chinook. It is anticipated that stock specific management will become more of an issue in the Yukon Territory as time progresses. Samples were collected from spawning stocks in each of the following: Nisutlin River, Big Salmon River, Big Salmon River, Tatchun Creek, Mayo River, and Takhini River, as well as from the Whitehorse Fishway. In addition, LGL consultants collected samples from Aboriginal fisheries in the Pelly, Stewart and mainstem Yukon rivers. Additional DNA material is being collected from archived scale samples and GSI samples.

6.2.9 Community Development and Education Program

In 1989, a community based incubation box program was initiated with the objectives of: 1) developing and demonstrating remote/isolated small scale incubation systems; 2) producing sufficient numbers of fry in specific locations for coded-wire tag releases; and, 3) providing local schools with a supply of eyed eggs for small (50-100 egg capacity) classroom incubators. The incubators are intended primarily for chinook salmon. A 120,000-egg capacity box was constructed on McIntyre Creek in Whitehorse, and a 60,000-egg capacity box was constructed on the North Klondike River near Dawson City. In 1991 and 1992, two 60,000-egg boxes were installed on the Mayo River. The Mayo incubation boxes have been idle since 1994; the Klondike River box has not been used since 1996. A summary of fry releases from these incubation boxes is presented in Table 8.

Beginning in the spring of 1996, the Whitehorse Correctional Centre has operated the McIntyre incubation box. The release sites for the Takhini River chinook stock incubated in the McIntyre box have included Flat Creek, a small, north bank tributary of the Takhini River, and the mainstem Takhini River, close to the outlet of Kusawa Lake. In August 1997, approximately 39,500 chinook salmon fry were released into the Takhini River system, 38,500 fry with CWT's and 1,000 fry without. In addition to the Takhini broodstock, chinook salmon eggs from Tatchun Creek were incubated in a modified fish tote at McIntyre Creek and the resulting 1,500 fry were released back into Tatchun Creek in June. All but 150 of these fry had been coded-wire tagged.

Ninety-five thousand Takhini chinook eggs and 49,000 Tatchun chinook eggs are currently being incubated at McIntyre Creek.

The educational program "Salmon in the Classroom" is now in all Yukon Territory schools. Teachers may choose to run classroom incubators as part of the program, incubating from 50 to 500 salmon eggs. Resultant fry are released into stream of origin. Three schools are currently incubating chum salmon eggs. Eighteen schools plan to used eyed eggs from the McIntyre site.

A Streamkeepers Society, which fosters stream stewardship, exists in the Yukon Territory. Workshops were held in fall 1996 and spring 1997, and handbooks were provided to all territory schools.

6.3 Upper Yukon River Fall Chum Tagging Project, 1996-1997

In 1996 between 1 August and 20 September, 17,751 fall chum salmon were captured in fish wheels at Rampart Rapids, spaghetti tagged, and released. From 2 August to 28 September, 45,232 fish were captured in fish wheels near the village of Rampart, approximately 50km upriver,

and examined for tags; about 3% (1,259) of the captured fish were tagged. Most tagged fish were caught within the week in which they were marked. Of 2,682 fish examined for tag loss, 210 had primary and secondary marks; no fish lost their primary mark. Results from data analyses indicated that tagged fish randomly mixed between marking and recapture sites. Recapture probabilities at the recovery site were associated with a fishes sex, size, and/or the interaction of sex and size thereby potentially biasing the estimate. Results from modeling the 1996 fall chum salmon run demonstrated that bias was minimal if the differential recapture probabilities were due to differential movement to recovery strata rather than due to differential capture probabilities. Migration rate data supported the notion that the differential recapture probabilities were due, at least in part, to differential movement from tagging to recovery strata of males and females. The above data were used to generate a Darroch population estimate of the run in the Yukon River above the Tanana River. The estimate of 651,614 $\pm$ 45,166 (95% CI) was within 9% of the estimate of 708,800 fall chum salmon obtained by adding the components of escapement estimates and harvest in the Upper Yukon River during 1996. Low capture to recapture ratios (R/C) at the DFO border fish wheel and at the Fishing Branch weir suggested the potential for the introduction of bias due to selective sampling. Subsequently, tag loss and R/C ratios were identified for further investigation in 1997.

In 1997, fish wheels were operated at the Rampart Rapids from 20 July to 20 September, 10 days longer than the previous year. Recovery fish wheels at Rampart captured fish from 21 July to 28 September. The left pelvic fin was clipped on all spaghetti-tagged fish to assess tag loss.

Additionally, data collection was modified in 1997 to provide a more representative sample of fish examined at the recovery site to allow for stratification by sex and size. Approximately 5% of the fish captured at the recovery site were tagged. Of the 9,697 fish examined for tag loss (about 100 fish per day), none had lost their primary mark. Initial statistical diagnostics indicate that stratification of the estimate by sex would reduce bias. The preliminary population estimate of fall chum salmon migrating past Rampart Rapids was 393,245 of which 196,000 $\pm$ 12,560 were females and 197,245 $\pm$ 13,588 were males. Tag loss and R/C ratios were also checked in the Fort Yukon area fish wheels. At Fort Yukon a total of 1,240 fish were examined from seven different fish wheels; 36 fish bore tags (2.9%) with no tag loss detected. Various fishermen reported R/C ratios for fish captured between the Nation River and Dawson; R/C ranged from 1.28% in Eagle, Alaska, to 0.51% in Canada. Tag loss was also checked by DFO Canada and Canadian fishers contracted through the Yukon Panel R&E Fund, and no tag loss was reported in 6,651 fish examined. Clearly tag loss is not a problem. However, the rate of tag recovery (R/C) appears to decrease as distance from the tagging site increases. Further investigation into the cause of changing recovery rates is warranted.

Radio telemetry fieldwork in 1997 focused on preparing for the proposed full-scale telemetry study on fall chum salmon in 1998 (Yukon River JTC 1996). A feasibility study in 1996 determined that fall chum salmon resumed upriver movements soon after being tagged with radio transmitters, and that the remote tracking system (RTS) used in previous telemetry studies (Eiler

1995) was effective in recording the movements of radio-tagged fish in the Yukon River Basin. The primary objectives in 1997 were to 1) install RTS stations at sites on the U.S.-Canada border, 2) select station sites on major spawning tributaries and 3) modify existing equipment to enhance station performance.

RTS station sites were selected and prepared near the U.S.-Canada border on the Yukon River main stem and the Porcupine River (Figure 3). Two stations were installed at each location to provide redundancy in the data collected. RTS stations on the Porcupine River were located 9 km down river from the border. The Yukon River main stem stations were placed in Canada approximately 85 km upriver from the border. This location was selected in order to avoid recording radio-tagged fish traveling into the Fortymile River, located 75 km upriver from the border; most of the Fortymile River drainage is in the U.S.

A station site was selected and cleared on the lower Porcupine River about 240 km upriver from the Yukon-Porcupine confluence (Figure 3). Station sites were selected on the Chandalar and Sheenjek Rivers. Sections of the Black River were surveyed with fixed-wing aircraft, and several potential sites were identified. Discussions were also held with members of the Chalkyitsik village council concerning the possible placement of a station near the village. Support from the Canadian DFO made it possible to conduct aerial surveys of the lower Stewart and White Rivers. A site was selected on the Stewart River. No suitable site was found near the mouth of the White River.

Five RTS stations were operated during the winter of 1996-97: two stations 11 km upriver from the Yukon River tagging site, one station at the Fishing Branch weir, and two test stations in Fairbanks. All five stations operated throughout the period that fall chum would be traveling upriver. The Fishing Branch station operated until late December. The stations near the tagging site and in Fairbanks operated throughout the winter, although cold temperatures from late December to early February appeared to affect equipment performance. The manufacturer is currently working to enhance performance at lower temperatures.

Several modifications were made to improve RTS performance. The receiving antenna array and associated switch box were redesigned to increase signal reception. New software was developed to increase the ability to determine the location (i.e., upriver or down river from the station) of radio-tagged fish. A new model of data collection platform (DCP), used by the station to store and transmit data via satellite, was tested in the field; the older version is no longer supported by the manufacturer. Efforts are continuing to standardize the output of the two models.

A 1997 telemetry study on sheefish (*Stenodus leucichthys*) conducted by the USFWS and ADF&G provided an opportunity to further evaluate RTS performance. Adult sheefish captured at the Yukon River tagging site were tagged with pulse-coded radio transmitters. Movement information collected during aerial tracking surveys was compared with data from the stations. All of the radio-tagged fish that moved past the stations were recorded. The new RTS software

made it possible to determine passage of the fish to the nearest hour.

Information was also collected on transmitter suitability. A 1997 telemetry study conducted by ADF&G on Toklat River fall chum salmon found that the stomach implant transmitters used, similar to those used on the Yukon River study, were too large for the fish. The transmitters ruptured the stomach wall when fully inserted. The fish were tagged in close proximity to spawning areas (i.e., within 30 km), and it is possible that this phenomenon was due to physical changes in the condition of the fish prior to spawning. To determine if a similar problem existed at the Yukon River tagging site, 18 fall chum salmon (9 males and 9 females) were tagged with radio transmitters, sacrificed and examined. The fish were sampled on 16 September during the last week of tagging, and ranged in length from 51 to 68 cm (average =57 cm) mid-eye to fork of tail. Only one fish, a 53 cm male, had a ruptured stomach. A male coho salmon 48 cm in length was also tagged successfully without rupturing the stomach.

7.0 RESTORATION AND ENHANCEMENT FUND PROPOSAL REVIEW PROCESS

The JTC received a brief summary from the Panel's Executive Secretary of the status of the Panel funded projects for the 1997 field season with the Restoration and Enhancement (R&E) Fund. A total of 33 projects had been reviewed last year. In addition to the 16 projects proposals which were funded at the March 1997 Panel meeting in Whitehorse, the Panel approved funding for an Interim Strategic Plan project to assist the Panel's effective management of the R&E Fund. The financial commitment for the 17 funded projects totaled approximately $480,600US.

The Executive Secretary informed all project proponents verbally and in writing of the Panel's decision. Contracts were developed with each successful applicant based on their proposal and to reflect the Panel's decisions where they varied from the original proposal. In addition, a technical point of contact (usually an agency person) was identified to be consulted before the work was to begin, and to approve progress reports and the final reports which were a condition of the respective payments made to the contractor.

All projects approved by the Panel were activated. One project is complete and the final report was submitted in September. An additional four projects have been completed and the final reports are pending. Five projects are scheduled for completion in November, one in December, three in March, and two in May.

JTC members then received a briefing from the R&E Subcommittee Co-Chairs regarding the proposal submission process during 1997 (1998 funding year) and Subcommittee progress to date on items relating to the technical review of the proposals.

A total of 37 proposals was received by the Executive Secretary by the closing date (30 September) for proposal submission for the 1998 funding cycle. These originated from 5 Alaskan

and 32 Canadian proposers. From 01 October to 02 November, the Executive Secretary and a DFO staff person completed an administrative screening and initial summarization of the 1998 proposals to assist the R&E Subcommittee technical review assignments.

The R&E Subcommittee met in Anchorage on 23 October, to review and update the proposal review form for the 1998 funding cycle, to schedule the January Subcommittee work session, and to review the proposal application form for 1998 (1999 funding year). The Subcommittee decided to depart from the format used in 1996/1997 and to develop two proposal review forms (Attachment II). One proposal review form would be used by technical reviewers. A second form would be used by the R&E Subcommittee as the form which would be submitted for public and Panel consideration incorporating the input from the technical reviewers.

After reviewing Subcommittee members' calendars, it became apparent that a January work session would be not be possible. The earliest date that the Subcommittee could have a work session and complete the technical review work would be 9 February. The Subcommittee discussed the impact this would have on the review process timeframe and developed a proposed timeframe (Attachment II). It is hoped the proposed schedule will minimize the effect of the delayed completion of the technical reviews.

The R&E Subcommittee briefly discussed updating the 1998 application form for the 1999 funding year, but did not make changes at that time. This was also discussed again, briefly, at the JTC meeting. The R&E Subcommitee will present recommended changes to the form at the November 1997 meeting of the Panel. Changes to the form recommended by the R&E Subcommittee are intended to provide additional information to applicants as to the evaluation criteria that would be used in the technical review of their application.

The Subcommittee noted during the 23 October work session that even though the proposal acceptance period began in January of 1997, the formal distribution of the proposal application packets did not occur until 28 June in Alaska, and 22 July in Canada. Additionally, the contents were not identical. For the integrity of the bilateral R&E program, the JTC recommends a unified approach through the Executive Secretary to avoid confusion and/or perceptions of unfairness.

The Subcommittee met again on 03 November in Whitehorse. The Subcommittee members received the 1998 funding year proposals and proposal summary information from the Executive Secretary and DFO staff person, and spent the day assigning lead subcommittee reviewers to each proposal.

Discussion occurred at the full JTC meeting regarding project reporting requirements. The JTC recommends to the Panel that:

1. the Executive Secretary receive final reports from project managers;
2. there should be a technical review of final reports by the technical contact person identified by the Executive Secretary;

3. the reports should contain an abstract which the Executive Secretary could use in compiling an annual R&E Fund program summary report which would be available for broad distribution;
4. the Executive Secretary archive the master copies of final project reports and provide copies to each of the Panel Co-Chairs and each of the JTC R&E Subcommittee Co-Chairs.

For the November 1997 Panel meeting, the JTC requests approval from the Panel for:
1. the 1998 funding year proposal review timeframe;
2. the revised application form; and
3. the proposed process for R&E Fund final reports.

8.0 CODED WIRE TAGGING REVIEW

At the fall meeting of the JTC a discussion took place regarding the historical application and recoveries of coded wire tags (CWT) on the Yukon River.

CWT release programs have been conducted in both the Middle Yukon River and the Upper Yukon River starting in the early 1980's. From the 1981 and 1984-86 brood years, chinook and coho salmon eggs were incubated at Clear Hatchery, a portion of the fry coded wire tagged, and released as noted in Table 6. The chinook were of Salcha River and Clear Creek stock, while the coho were of Clear Creek and Wood Creek stock. From the 1992 through 1995 brood years, Clear Hatchery was used for Toklat River fall chum salmon incubation, with outplanting back into the Toklat River. Larger numbers, relative to the chinook and coho salmon releases, of CWT Toklat River fall chum salmon were released as part of the Toklat River fall chum salmon restoration project. A list of releases and recoveries in the Alaska portion of the drainage, as provided by the ADF&G Tag Lab, is presented in Table 6.

Groups of Upper Yukon River chinook salmon have been tagged annually in the Yukon Territory since 1985 (principally by DFO). Releases of Upper Yukon chinook salmon are summarized in Tables 7 and 8. Approximately 80% of all the fish tagged originated from the Whitehorse Rapids Fish Hatchery (WRFH). This facility was constructed in 1984 in concert with the construction a fourth turbine at the Whitehorse dam. The WRFH was constructed in order to offset the impact of the hydroelectric power generating facility project on juvenile chinook salmon migrating downstream from the upper lakes area of the Yukon River in Canada. Over the 1985 to 1996 period, the hatchery released a total of more than three million chinook salmon fry. Of these, 1.8 million were tagged with CWTs and externally marked using adipose fin clips. CWT release groups have, on average, numbered 150,000 and have comprised from 34% to 100% of the annual hatchery releases. The tags were applied to young of the year (also known as age "sub 1" or "0 check") fry in late May or early June, after a period of rearing subsequent to ponding, i.e. the transfer of fry from egg incubation trays to rearing troughs, in February. The majority of the fry were subsequently released into the Yukon River upstream of the hydroelectric facility.

However, each year from 1989 to 1994, approximately 50,000 marked fry were released immediately downstream of the hydroelectric dam, in the fishway constructed to allow adult passage past the dam. This was done with the objective of gaining information on the effect of the dam (by comparing return rates of above dam releases to below dam releases).

In addition to the WRFH, small scale incubation boxes at three different locations in the upper Yukon River drainage have produced fry. Two of the three incubation systems were established in 1989; the other one was established in 1991. Further details are presented in Section 6.2.9. The first release of chinook salmon fry marked with CWTs from these incubation boxes occurred in 1991. Over the period 1991 to 1996, a total of approximately 490,000 fry was released (all three incubation systems combined). Of these, 445,000 have been marked with CWTs. Marked release groups have, on average, numbered approximately 78,000 and have comprised from 80% to 100% of the releases annually. As with WRFH fry, releases have involved young of the year fry. Low water temperatures have prevented rearing of some fry to a size suitable for full tags; consequently, half tags have been used frequently.

At the time of writing, four upper Yukon chinook salmon tag recoveries have been reported from offshore fisheries. Three of the tags were recovered in Bering Sea trawl fisheries; the other was recovered a Gulf of Alaska trawl fishery. Each chinook salmon had originated from the Whitehorse hatchery and had been released in spring 1989, 1990, 1991 or 1992. Respective recoveries were made in March 1992, March 1994, December 1994 and February 1995.

Commercial sampling in Alaskan Districts 1, 2 and 4 in the Yukon River has included a CWT component. In District 1, the number of fish examined for CWTs has averaged approximately 3,200 annually over the period 1992-1994. The number of tags CWTs recovered in each of these years has averaged 10. Based on this data, CWT fish comprised from 0.08% to 0.4% of the sample for these years. In 1997, out of a sample of 3,716 chinook salmon in the Lower Yukon River, nine adipose-clipped fish were observed. Two were sold in the round, but heads from the other 7 were collected and sent to the ADF&G Tag Lab for analysis.

Two fishwheels located just upstream of the Canada/US border used to live capture chinook and chum salmon for a mark/recapture program also act as a test fishery (see Section 6.2.1). Numbers of marked fish captured in the fishwheels have been recorded since 1994. Of the fishwheel chinook catch, marked fish have comprised 1.2% in 1994 (N=1,290), 1.3% in 1995 (N=2,216) and 0.6% in 1996 (N=1,749). CWT's were not recovered in this location (fish were not sacrificed). Hence, only the "mark rate" was determined; determination of the "mark composition" was not possible without retrieving CWTs.

In 1994 and 1995, CWTs were solicited from (primarily commercial) fishers by offering a reward of $10 for each recovery. This was done in an attempt to maximise the recoveries of tags in the absence of a directed sampling program. Without information on the exact number of fish examined for CWTs, determination of contribution rates, i.e. mark rates, of the Whitehorse

hatchery and incubation boxes to the fisheries was not possible. The focus was on determination of mark composition. The number of CWT recoveries in 1994 from the commercial fishery was 20, 0.2% of the chinook harvest of 12,028 fish; no CWT's were recovered from the domestic, Aboriginal and sport fisheries combined. In 1995, commercial fishers supplied 57 heads that contained CWTs; this comprised 0.5% of the chinook harvest of 11,146 fish. In addition, a sampler examined 2,100 commercially harvested chinook for missing adipose fins prior to removal of tagged fish by fishers; 0.75% of these fish were marked. However, it is not known what proportion of these marked fish contained CWT's. These marked fish were not distinguished from heads voluntarily submitted by fishers and are included in the above total of 57.

In 1996, the reward system was not used. Determination of mark rate, in addition to the determination of mark composition, was an objective. Fishers were asked to ignore adipose-clips. Instead, a fixed number of chinook salmon were examined for CWTs by a designated sampler. The designated sampler was a fisherman who was contracted to provide scales, length, sex composition and CWT samples from the harvest in the Yukon River in the vicinity of its confluence with the Fortymile Rivers, where a significant proportion of the total harvest is taken. In 1996, out of a sample of 1,600 chinook, six (0.4%) marked fish were recovered. In 1997, fifteen marked fish (1%) were recovered from a sample of 1,392 chinook. Summary CWT data for these years are not yet available.

Sampling for mark rates in adult chinook salmon passing through the Whitehorse Rapids Fishway has been conducted since the WRFH program commenced. However, apart from some broodstock samples, sampling for mark composition did not begin there until 1995. The sampling involved the sacrifice of a number of marked fish which ascended the fishway. Due to sensitivities associated with lethal sampling of chinook salmon at a tourist facility, sampling rates to date have been low. In 1995, 53 (7%) of the 757 marked fish were removed for CWT retrieval Results indicated the survival to escapement of the age-5 component of the cohort spawned in 1990 averaged 0.4% (range 0.1% to 0.6%) for the different release groups. In 1996, 48 (11%) of the 423 marked fish were removed for CWTs. In 1997, 68 (34%) out of 201 marked fish were taken for CWT recovery. Processing of 1996 and 1997 data is incomplete at time of writing.

Escapement sampling for returns from in-stream incubation/rearing sites was conducted at Flat Creek in 1995, 1996 and 1997. No returns were observed in 1995. In 1996, two chinook were reported, one of which was adipose-clipped. Eighteen adipose-clipped adult chinook carcasses were observed in 1997 of which 14 heads were recovered for CWT reading.

Upon reviewing the CWT program to date, with the annual output of significant number of CWTed fry, there is an excellent opportunity for acquisition of stock specific survival rates, fishery contribution rates, and migration timing. It does not appear this opportunity is being fully capitalised upon due to incomplete/inconsistent sampling of the various fisheries throughout the length of the river. If restoration activities increase, there is potential for additional CWT programs to develop for evaluation purposes; there may also be interest in developing wild

salmon CWT projects. A more comprehensive and directed sampling program could benefit all existing and new CWT programs. In any given fishery, the relative abundance of marked fish will largely determine the level of sampling required to obtain statistically meaningful information. It is recognized that increased funding would be required to conduct expanded sampling programs but that the relative costs of recovering tags will decrease as the number of CWT programs increases.

9.0 LITERATURE CITED

Eiler, J. H. 1995. A remote satellite-linked tracking system for studying Pacific salmon with radio telemetry. Transactions of the American Fisheries Society 124:184-193.

Yukon River Joint Technical Committee. 1996. Yukon River Joint Technical Committee Report, May 1-2, 1996. Anchorage, AK. 12 pp

Headlee, P.G. 1997. Toklat River intra-gravel water and air temperature investigations: a progress report, 1994-1997. Tanana Chiefs Conference, Inc. Fairbanks, AK. Water Resources Report No. 97-2.

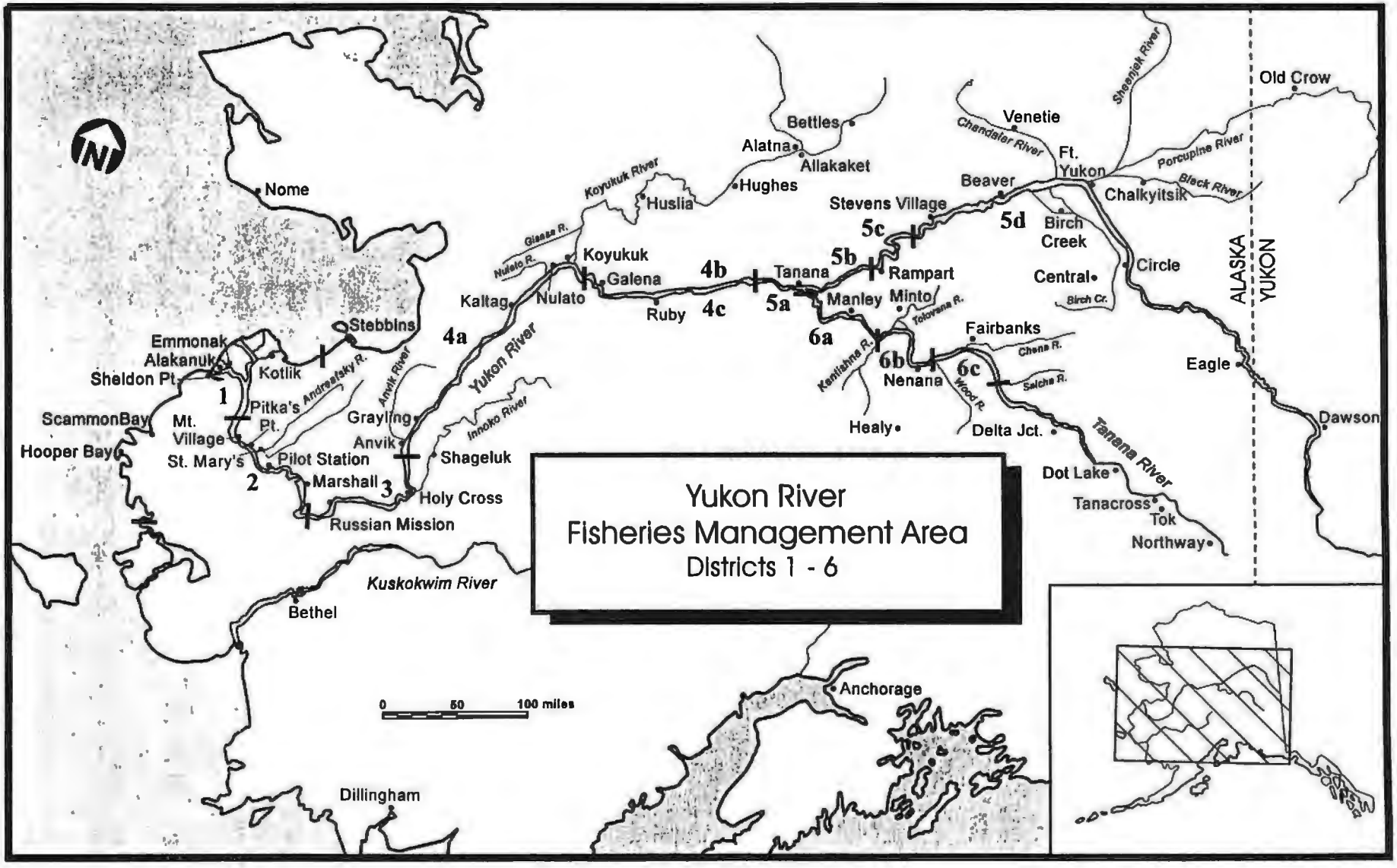


Figure 1. Map of the Alaskan portion of the Yukon River drainage showing communities and fishing districts.

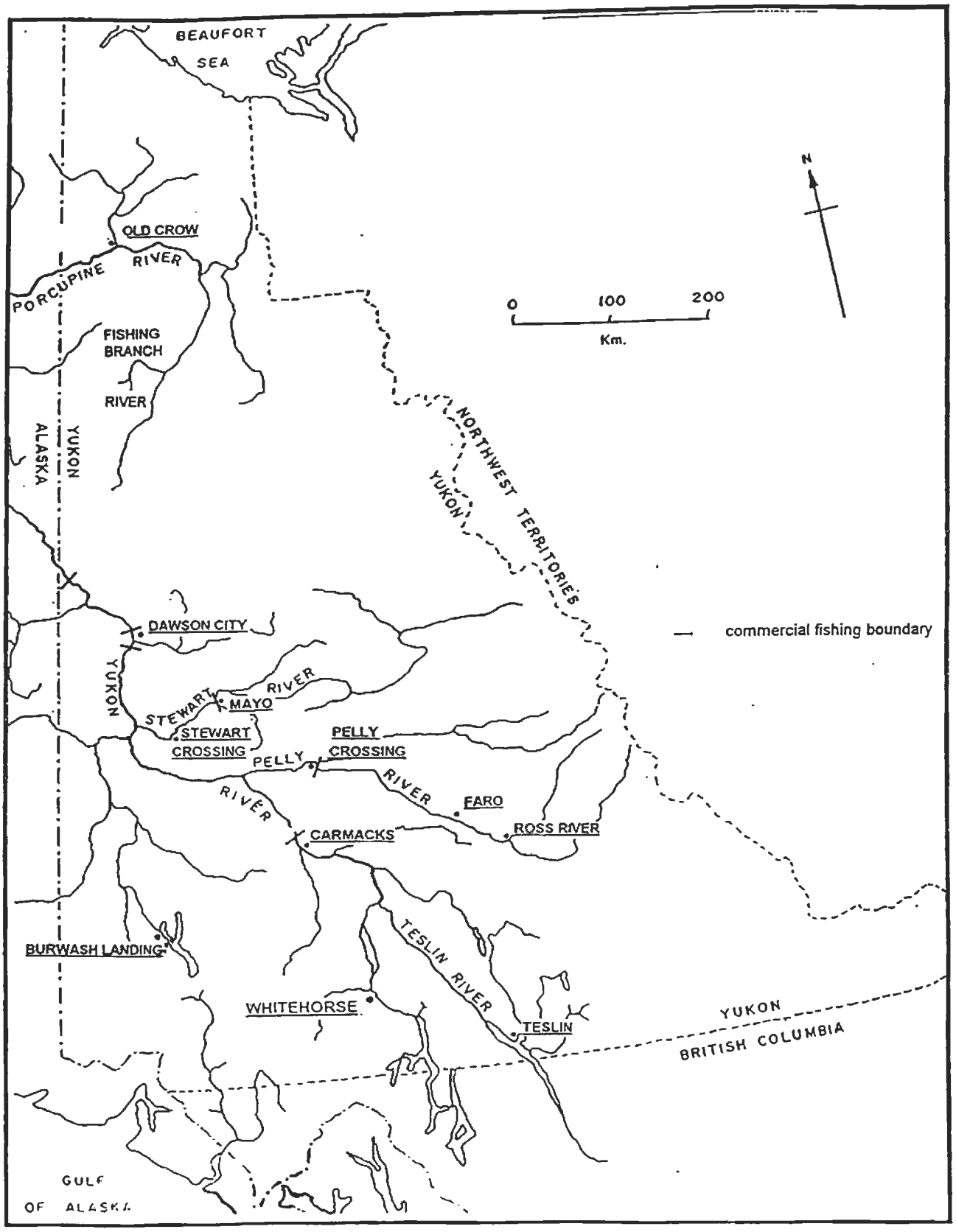


Figure 2. Map of the Canadian portion of the Yukon River, showing commercial fishing boundaries.

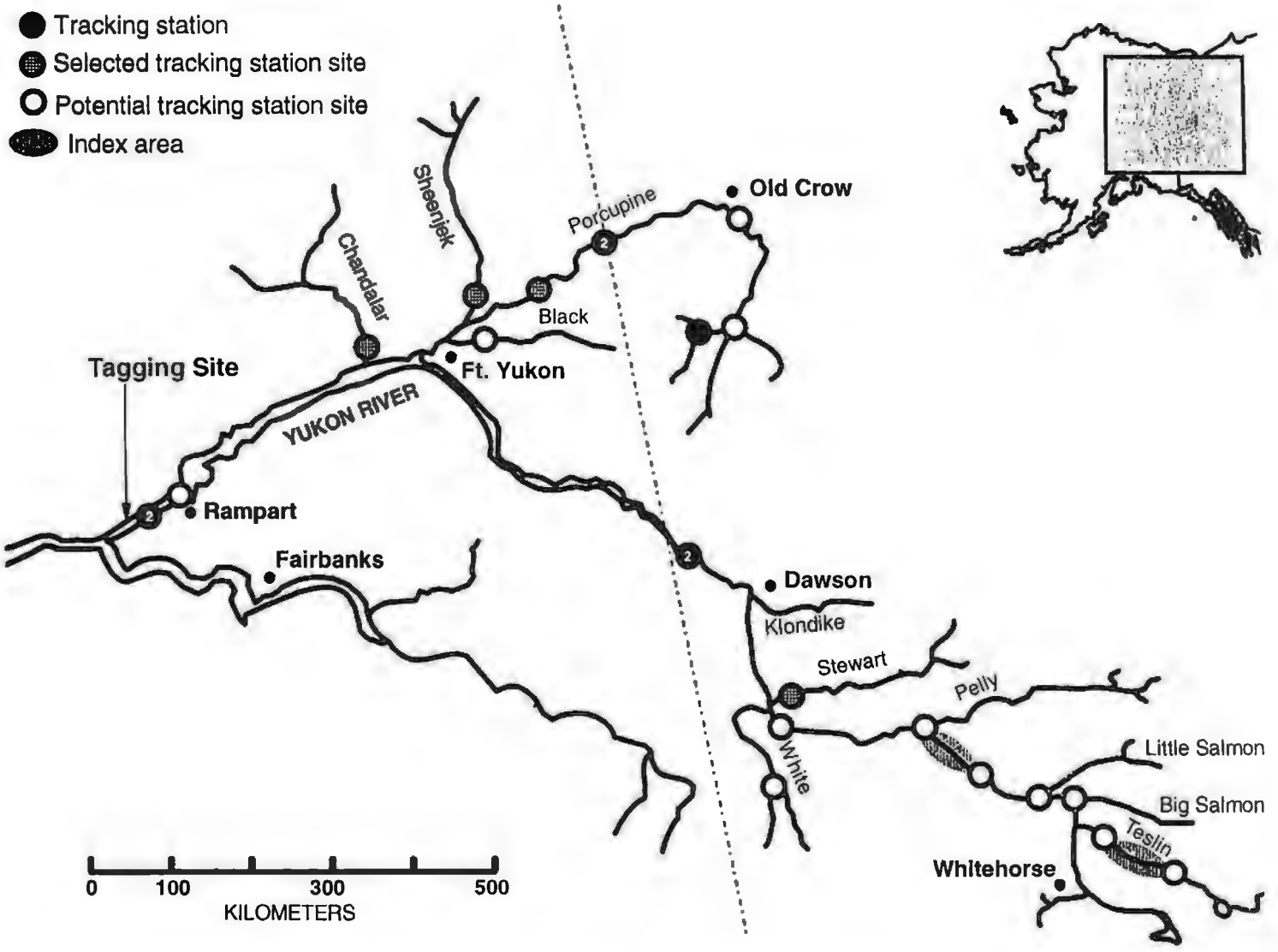


Figure 3 . Map of upper Yukon River Basin showing the location of existing and proposed remote tracking stations

Table 1. Preliminary estimates of commercial salmon sales and estimated harvests in the Alaska portion of the Yukon River drainage, 1997.[a,b]

District Subdist.	No. of Fishermen[c]	Chinook			Summer Chum			Fall Chum			Coho			Total		
		Numbers	Roe	Estimated	Numbers	Roe	Estimated	Numbers	Roe	Estimated	umbers	Roe	Estimated	Numbers	Roe	Estimated
1	463	66,384	0	66,384	59,915	0	59,915	27,483	0	27,483	21,450	0	21,450	175,232	0	175,232
2	221	39,363	0	39,363	18,242	0	18,242	24,326	0	24,326	13,056	0	13,056	94,987	0	94,987
Subtotal		105,747	0	105,747	78,157	0	78,157	51,809	0	51,809	34,506	0	34,506	270,219	0	270,219
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Lower Yukon	640	105,747	0	105,747	78,157	0	78,157	51,809	0	51,809	34,506	0	34,506	270,219	0	270,219
Anvik River	9	0	0	0	0	13,067	13,548							0	13,067	13,548
4-A	24	0	0	0	0	56,301	100,389 d							0	56,301	100,389
4-B,C	12	1,450	14	1,457	2,062	4,863	10,734 d	2,458	0	2,458	814	0	814	6,784	4,877	15,463
Subtotal District 4	*39*	*1,450*	*14*	*1,457*	*2,062*	*74,231*	*124,671*	*2,458*	*0*	*2,458*	*814*	*0*	*814*	*6,784*	*74,245*	*129,400*
5-A,B,C	27	3,071	0	3,071	125	0	125	1,595	1,194	3,069	0	0	0	4,791	1,194	6,265
5-D	4	607	0	607	12	0	12	851	0	851	0	0	0	1,470	0	1,470
Subtotal District 5	*31*	*3,678*	*0*	*3,678*	*137*	*0*	*137*	*2,446*	*1,194*	*3,920*	*0*	*0*	*0*	*6,261*	*1,194*	*7,735*
District 6	15	1,968	3,211	2,728	14,886	9,036	25,287	0	0	0	0	0	0	16,852	12,247	28,015
Total Upper Yukon	85	7,094	3,225	7,863	17,085	83,267	150,095	4,904	1,194	6,378	814	0	814	29,897	87,688	165,150
Total Yukon Area	725	112,841	3,225	113,610	95,242	83,267	228,252	56,713	1,194	58,187	35,320	0	35,320	300,116	87,686	435,369

a Commercial sales reported in numbers of fish sold in the round and pounds of unprocessed roe sold by fishermen. Unless otherwise noted, estimated harvest is the number of fish sold in the round plus the estimated number of females harvested to produce the roe sold.

b Does not include Department test fish sales.

c Number of unique permits fished by district, subdistrict, or area. Area totals may not add up due to transfers between districts or subdistricts.

d Estmated number of male and female salmon harvested to produce roe sold.

Table 2. Commercial sales of salmon and salmon roe in the Alaska portion of the Yukon River drainage, 1961-1997. [a]

Year	Chinook		Summer Chum		Fall Chum		Coho	
	Numbers	Roe (lbs.)	Numbers	Roe (lbs.)	Numbers	Roe (lbs.)	Numbers	Roe (lbs.)
1961	119,664	-	0	-	42,461	-	2,855	-
1962	94,734	-	0	-	53,116	-	22,926	-
1963	117,048	-	0	-	0	-	5,572	-
1964	93,587	-	0	-	8,347	-	2,446	-
1965	118,098	-	0	-	23,317	-	731	-
1966	93,315	-	0	-	71,045	-	19,254	-
1967	129,656	-	10,935	-	38,274	-	11,047	-
1968	106,526	-	14,470	-	52,925	-	13,303	-
1969	91,027	-	61,966	-	131,310	-	15,720	-
1970	79,145	-	137,006	-	209,595	-	13,778	-
1971	110,507	-	100,090	-	189,594	-	13,226	-
1972	92,840	-	135,668	-	152,176	-	23,465	-
1973	75,353	-	285,509	-	232,090	-	49,644	-
1974	98,089	-	589,892	-	289,776	-	16,777	-
1975	63,838	-	710,295	-	275,009	-	2,546	-
1976	87,776	-	600,894	-	156,390	-	5,184	-
1977	96,757	-	534,875	-	257,986	-	38,863	-
1978	99,168	-	1,052,226	25,761	236,383	10,628	26,152	-
1979	127,673	-	779,316	40,217	359,946	18,466	17,165	-
1980	153,985	-	928,609	139,106	293,430	5,020	8,745	-
1981	156,706	-	1,003,556	189,068	466,451	11,285	23,651	-
1982	123,174	-	460,167	152,819	224,187	805	36,895	-
1983	146,904	-	742,463	149,999	302,598	5,064	13,157	-
1984	118,815	-	586,375	167,224	207,938	2,328	81,826	-
1985	145,476	-	514,900	248,625	267,302	2,525	57,521	-
1986	99,268	-	719,234	271,691	138,688	577	47,162	-
1987	133,558	-	439,854	121,968	0	0	0	-
1988	100,364	-	1,148,650	256,535	133,320	3,227	86,187	-
1989	104,198	-	955,806	288,549	266,206	14,749	81,548	-
1990	95,247	1,731	303,858	109,376	122,010	10,944	41,032	4,042
1991	104,878	3,829	349,113	141,976	230,852	19,395	103,180	4,299
1992	120,245	3,164	332,313	112,996	15,721	2,806	6,556	1,680
1993	93,550	2,014	96,522	22,962	0	0	0	0
1994	113,137	2,394	80,284	97,757	3,631	3,276	120	5,588
1995	122,728	5,357	259,774	290,737	250,733	32,502	45,939	2,229
1996	89,671	1,470	145,593	314,759	88,342	14,671	52,643	4,829
1997	112,841	3,225	95,242	83,267	56,713	1,194	35,320	0
1992-96 Avg.	107,866	2,880	182,897	167,842	71,685	10,651	21,052	2,865

a Commercial sales reported in numbers of fish sold in the round and pounds of unprocessed roe sold by fishermen.

Table 3. Canadian weekly commercial catches of chinook and chum salmon in the Yukon River in 1997.

Statistical Week	Week Ending	Start Date	Finish Date	Days Fished	Number Fishing	Boat* Days	Chinook Salmon	Chum Salmon	Coho Salmon
27	05-Jul			0	0	0.0	0	0	0
28	12-Jul			0	0	0.0	0	0	0
29	19-Jul	13-Jul	16-Jul	3	12	37.0	1167	0	0
30	26-Jul	20-Jul	25-Jul	5	9	47.0	1838	2	0
31	02-Aug	27-Jul	01-Aug	5	9	45.0	1364	5	0
32	09-Aug	03-Aug	08-Aug	5	3	15.0	438	0	0
33	16-Aug	10-Aug	15-Aug	5	2	9.0	198	8	0
34	23-Aug	17-Aug	17-Aug	CLOSED	0	0.0	0	0	0
35	30-Aug	24-Aug	24-Aug	CLOSED	0	0.0	0	0	0
36	06-Sep	31-Aug	31-Aug	CLOSED	0	0.0	0	0	0
37	13-Sep	07-Sep	07-Sep	CLOSED	0	0.0	0	0	0
38	20-Sep	15-Sep	17-Sep	2	5	9.0	1	2357	0
39	27-Sep	22-Sep	24-Sep	2	5	10.0	0	2078	0
40	04-Oct	29-Sep	03-Oct	4	3	10.0	0	2087	2
41	11-Oct	06-Oct	10-Oct	4	2	8.0	0	1194	
42	18-Oct	14-Oct	17-Oct	3	0				
Dawson area subtotal				35		190.0	5006	7731	2
Upriver commercial subtotal (reported to date)							305	143	
Total Commercial Harvest							5311	7874	2
Domestic Harvest (preliminary)							121	0	
Estimated Recreational Harvest (season estimate)							1230	0	0
Aboriginal Harvest (season estimate to date - November 04, 1997)							8942	1216	0
TOTAL UPPER YUKON HARVEST (preliminary)							**15604**	**9090**	2
Old Crow A (incomplete)							496	4144	87

Table 4. Salmon fishery projects conducted in the Alaskan portion of the Yukon River drainage in 1997.

Project Name	Location	Primary Objective(s)	Duration	Agency	Responsibility
Commercial Catch and Effort Assessment	Alaskan portion of the Yukon River drainage	document and estimate the catch and associated effort of the Alaskan Yukon River commercial salmon fishery via receipts (fish tickets) of commercial sales of salmon or salmon roe.	June - Sept.	ADF&G	all aspects
Commercial Catch Sampling and Monitoring	Alaskan portion of the Yukon River drainage	determine age, sex, and size of salmon harvested in Alaskan Yukon River commercial fisheries; monitor Alaskan commercial fishery openings and closures.	June - Sept.	ADF&G ADPS	all aspects enforcement
Subsistence Catch and Effort Assessment	Alaskan portion of the Yukon River drainage	document and estimate the catch and associated effort of the Alaskan Yukon River subsistence salmon fishery via interviews, catch calendars, mail-out questionnaires, telephone interviews, and subsistence fishing permits.	post-season	ADF&G	all aspects
Sport Catch, Harvest and Effort Assessment	Alaskan portion of the Yukon River drainage	document and estimate the catch, harvest, and associated effort of the Alaskan Yukon River sport fishery via post-season mail-out questionnaires.	post-season	ADF&G	all aspects
Yukon River (Alaskan Portion) Comprehensive Salmon Plan	Alaskan portion of the Yukon River drainage	develop a comprehensive plan for restoration and enhancement of salmon stocks of the Alaskan portion of the Yukon River drainage; define goals and objectives; identify potential opportunities and concerns; recommend appropriate procedures; evaluate priorities.	ongoing	ADF&G , YRDFA, & USFWS	all aspects
Yukon River Salmon Stock Identification	Yukon River drainage	estimate chinook salmon stock composition of the various Yukon River drainage harvests through analyses of scale patterns, age compositions, and geographical distribution of catches and escapements;	ongoing	ADF&G DFO & USFWS	all aspects provides scale samples
		develop and improve genetic stock identification (GSI) techniques for identification of chum salmon harvests to region of origin;		ADF&G DFO & USFWS	all aspects provides samples
		estimate stock compositions of mixed-stock salmon harvests collected in previous years;		USFWS ADF&G	all aspects assisted in Distr. 1 sampling
		investigate the utility of mtDNA, microsatellite, and intron markers in identifying U.S./Canada fall chum salmon stocks; produce draft report.		USGS-BRD USFWS & ADF&G	lead agency in pilot study participating in pilot study
Yukon River Salmon Escapement Surveys and Sampling	Alaskan portion of the Yukon River drainage Nenana River drainage	estimate population size, or index the relative abundance, of chinook, chum, and coho salmon spawning escapements by aerial, foot, and boat surveys; estimate age, sex and size of selected tributary chinook, chum, and coho salmon spawning populations.	July - Nov. Sept.-Oct.	ADF&G TCC/BSFA	all aspects conduct surveys
Lower Yukon Set Gillnet Test Fishing	South, Middle, and North mouths of the Yukon River delta, RM 20	index chinook, summer and fall chum, and coho salmon run timing and abundance using set gillnets. sample captured salmon for age, sex, size composition information.	June - Aug.	ADF&G	all aspects
Mountain Village Drift Gillnet Test Fishing	mainstem Yukon River, RM 87	determine feasibility of using drift gillnets to index timing and relative abundance of fall chum and coho salmon runs.	Aug.-Sept.	Asa'carsarmiut Trad. Council & ADF&G	all aspects implementation with BSFA funding
East Fork Weir, Andreafsky River	mile 20 East Fork RM 124	estimate daily escapement, with age, sex and size composition, of chinook, summer chum and coho salmon into the East Fork of the Andreafsky River.	June - Sept.	USFWS Yupiit of Andreafsky Algaaciq Tribal Council	all aspects partial funding from BSFA Aug.-Sept.

continued

Project Name	Location	Primary Objective(s)	Duration	Agency	Responsiblity
Yukon River Sonar	Pilot Station, RM 123	estimate chinook, summer and fall chum salmon passage in the mainstem Yukon . River.	June - Sept.	ADF&G AVCP BSFA	all aspects partial funding
Anvik River Sonar	mile 40 Anvik River, RM 358	estimate daily escapement of summer chum salmon into the Anvik River; estimate age, sex, and size composition of the summer chum salmon escapement.	June - July	ADF&G	all aspects
Kaltag Creek Tower	mile 1 Kaltag Creek, RM 451	estimate daily escapement of chinook and summer chum salmon into Kaltag Creek; estimate age, sex, and size composition of the summer chum salmon escapement.	June - July	City of Kaltag ACE BSFA	all aspects provided funding
Nulato River Tower	mile 3 Nulato River, RM 486	estimate daily escapement of summer chum and chinook salmon into the Nulato River; estimate age, sex, and size composition of the summer chum salmon escapement.	June - July	NTC ADF&G BSFA	all aspects provide funding
Gisasa River Weir	mile 3 Gisasa River, Koyukuk River drainage, RM 567	estimate daily escapement of chinook and summer chum salmon into the Gisasa River; estimate age, sex, and size composition of the chinook and summer chum salmon escapements.	June - July.	USFWS	all aspects
Clear Creek Tower	mile 0 Clear Creek, Hogotza River drainage, Koyukuk River drainage, RM - 780	estimate daily escapement of chinook and summer chum salmon into Clear Creek; estimate age, sex, and size composition of the summer chum salmon escapement.	June-Aug	USFWS BSFA	all aspects
South Fork Koyukuk River Weir	South Fork Koyukuk River near mouth of Fish Creek RM > 1,117	estimate daily escapement of chinook, summer chum and fall chum salmon to the South Fork Koyukuk River estimate age, sex, and size composition of the salmon escapement.	July-Sept.	USFWS	all aspects
Upper Yukon-Porcupine River Radio Telemetry and mark-recapture	mainstem Yukon River, near Rampart, RM 763	evaluate feasibility of using radio-telemetry and mark-recapture in a combined approach to estimate stock composition and timing of fall chum salmon in upper Yukon-Porcupine River drainages.	Aug.-Sept.	USFWS, USGS-BRD ADFG, NMFS, TCC, DFO co-op. project	all aspects
Chandalar River Sonar	mile 14 Chandalar River, RM 996	investigate feasibility of using split-beam sonar equipment to estimate fall chum salmon escapement.	Aug. - Sept.	USFWS	all aspects
Sheenjek River Sonar	mile 6 Sheenjek River, Porcupine River drainage, RM 1,060	estimate daily escapement of fall chum salmon into the Sheenjek River; estimate age, sex, and size composition of the fall chum salmon escapement.	Aug. - Sept.	ADF&G	all aspects
Nenana River Escapement Surveys	Nenana River drainage, above RM 860	aerial and ground surveys for numbers and distrubution of coho and chum salmon in ten tributaries of the Nenana below Healy Creek.	Sept. - Oct.	TCC BSFA	all aspects funding
Tanana Village North and South banks Yukon River Fish Wheels, Test Fishing	Mainstem Yukon River Tanana, RM 695	index the timing of fall chum salmon on the north bank of the Yukon River; and index the timing of chum and coho salmon on the south bank of the Yukon River bound for the Tanana River drainage, using test fish wheels. South bank test fish wheel also used for Toklat CWT recovery.	Aug. - Sept.	ADF&G BSFA	all aspects partial funding
Tanana River Fish Wheel Test Fishing	mainstem Tanana River Nenana, RM 860	index the timing of summer chum, and / or fall chum, and coho salmon runs using test fish wheels.	June - Sept.	BSFA	all aspects

continued

Table 4. (page 3 of 3).

Project Name	Location	Primary Objective(s)	Duration	Agency	Responsibility
Tanana River Tagging	mainstem Tanana River between RM 793 and 860.	estimate the population size of the Tanana River fall chum salmon run above the confluence of the Kantishna River using mark-recapture methodology;	Aug. - Sept.	ADF&G	all aspects
				BSFA	provided partial funding
Beaver Creek Weir	mile 200 Beaver Creek Yukon River, RM 932	estimate daily escapement of chinook and chum salmon into the upper portion of Beaver Creek.	July - Sept.	BLM	all aspects
Toklat River Radio Tagging	Toklat River, Tanana River drainage, between RM 848-878	evaluate freasibility of using radio telemetry to estimate spawner location and residence time in Toklat spawning areas.	Aug. - Oct	ADF&G	all aspects
Toklat River Ground Survey	Toklat River, between RM 848 and 853	estimate fall chum spawning escapement in Tolkat Springs and vacinity.	mid-Oct.	ADF&G	all aspects
Toklat River Fall Chum Salmon Restoration Feasibility Study	5-A Test Fish Wheel RM 690 Manley Recovery RM 765 Toklat River Recovery RM 848 Toklat Spawning Ground RM 878	Estimate proportion of Toklat River fall chum salmon return consisting of hatchery reared fish. Estimate the proportion and timing of Toklat River fall chum salmon migrating through and/or harvested in Sudistricts 5-A and 6-A. Estimate the precision of tagged fish homing within the Toklat River springs area.	Aug.-Oct.	ADF&G	all aspects
				BSFA	provided funding for Subdistrict 5-A recovery wheel assistance
Chena River Tower	mile 1 Chena River, Tanana River drainage, RM 921	estimate daily escapement of chinook and summer chum salmon into the Chena River.	July - Aug.	ADF&G	all aspects
Salcha River Tower	mile 2 Salcha River, Tanana River drainage, RM 967	estimate daily escapement of chinook and summer chum salmon into the Salcha River.	July - Aug.	ADF&G	all aspects

Agency Acronyms:

ACE	= Alaska Cooperative Extension
ADF&G	= Alaska Department of Fish and Game
ADPS	= Alaska Department of Public Safety
AVCP	= Association of Village Council Presidents, Inc.
BSFA	= Bering Sea Fishermen's Association
BLM	= Borough of Land Management
CATG	= Council of Athabascan Tribal Governments
DFO	= Department of Fisheries and Oceans (Canada)
NMFS	= National Marine Fisheries Service
NTC	= Nulato Tribal Council
TCC	= Tanana Chiefs Conference, Inc.
USFWS	= United States Fish and Wildlife Service
USGS - BRD	= United States Geological Survey - Biological Resource Division
YRDFA	= Yukon River Drainage Fisheries Association

Table 5. List of salmon harvest, escapement monitoring, and fry marking projects conducted in the Canadian portion of the Yukon River drainage in 1997.

Project Name	Location	Primary Objective(s)	Duration	Agency	Responsibility
Yukon Mark-Recapture	approx. 5 miles above Canada/U.S. border	- determine population, escapement and harvest rate estimates of chinook and chum salmon entering the Canadian section of the upper Yukon River; - inseason run forecasting.	June 15 - Oct 15	DFO	All aspects
				YRCFA	Chum live-capture fishery for recapture component
Commercial Catch Monitoring	Dawson City	- determine weekly catches in the Canadian commercial fishery; - recovery of tags.	July 1 - Oct 15	DFO	All aspects
Aboriginal Catch Monitoring	Yukon communities	- determine weekly catches in the Aboriginal fishery; recovery of tags; - implementation of Land Claims Agreement;	July 1 - Oct 15	DFO, LGL, Yukon First Nations	Joint project
Escapement Sampling	various tributaries	- to obtain age, size, sex composition of chinook and chum spawning escapement;	Oct 15 - Nov 1	DFO	All aspects
DNA collection	various tributaries	- to develop a DNA baseline of upper Yukon chinook stocks;	Aug 1 - Sept 15	YSC	
				DFO	Data collection, DNA processing
Commercial Catch Sampling	Dawson City	- to obtain age, size, sex composition of commercial catch; - to sample for coded wire tags, spaghetti tag loss.	July 1 - Oct 15	DFO	All aspects
Aerial surveys	chinook & chum index streams	- to obtain escapement counts in index spawning areas.	Aug 15 - Nov 1	DFO	All aspects
Fishing Branch Chum Weir	Fishing Br. River	- to enumerate chum salmon returning to the Fishing Branch River and obtain age, size and sex composition data.	Sept 1 - Nov 1	VGFN	Data Collection
				DFO	Administration
Whitehorse Hatchery CK CWT	Whitehorse	- to coded-wire tag the fry produced at the Whitehorse Hatchery.	May 15 - June 1	DFO, YFGA	Joint Project
MacIntyre Incubation Box	Whitehorse	- incubate 100K CK eggs and apply coded wire tags to resulting fry.	year round	DFO	Technical support
				WCC	Field work, project monitoring
Tachun Creek Weir and Sport Harvest Study	Tatchun Creek area	- to enumerate adult CK returns to Tatchun Ck. - document Tatchun Ck. area CK sport catch - obtain age, size, sex information from catch	July 15- Sept 15	QC	All aspects
				DFO	Technical assistance
Blind Creek Weir	Faro	- enumerate adult CK returns to Blind Creek	July 15- Sept 1	RRDC	Ross River Dena Council
				DFO	Technical assistance
Flat Creek Weir	Whitehorse	- enumerate adult CK CWT returns to the Takhini River.	Aug 1 - Sept 1	DFO	All aspects
Wolf Creek Weir	Whitehorse	- enumerate Whitehorse Hatchery CK returns.	Aug 1 - Sept 1	YFGA	All aspects

Table 6. Summary of juvenile salmon coded wire tag releases, recoveries, and related information for the Alaska portion of the Yukon River drainage.

TAG_CODE	YEAR_BROOD	STOCK	SPECIES_RELEASE	STAGE	YEAR_RELEASE	RELEASE SITE	DATE_LAST_RELEASED	RETENTION PERCENT	TAG_LOSS_DAY	TAGGED	SHED	TOTAL_UNMARKED	TOTAL_RELEASED	TAG_RATIO	ADULT FISH RECOVERED WITH CWT
311606	1981	SALCHA R	CHINOOK		1982	FOSTER CR 334-40	05/01/82	100	3	25014	0	77953	102967	4 116	0
311607	1981	CLEAR CR	COHO		1982	FOSTER CR 334-40	05/01/82	99	3	25086	253	100543	125882	5 018	8
311658	1984	SALCHA R	CHINOOK		1985	WOOD CR 334-40	05/01/85	99 6	1	25154	101	65236	90491	3 597	0
B41510	1984	WOOD CR 334-40	COHO		1985	CLEAR CR 334-40	05/01/85	89.8	1	10284	1168	71548	83000	8 07	22
311659	1984	WOOD CR 334-40	COHO		1985	FOSTER CR 334-40	05/01/85	98 2	1	14847	272	67897	83016	5 591	65
B30908	1985	CLEAR CR	CHINOOK		1986	WOOD CR 334-40	05/02/86	99	0	24979	252	178040	203271	8 138	0
B30901	1985	CLEAR CR	COHO		1986	CLEAR CR 334-40	04/29/86	97.8	0	15137	341	64800	80278	5 303	11
B30815	1985	WOOD CR 334-40	COHO		1986	WOOD CR 334-40	04/29/86	94 2	0	15050	927	65000	80977	5 381	64
311748	1986	CLEAR CR	CHINOOK		1987	WOOD CR 334-40	05/08/87	87.4	2	22009	3173	83226	108408	4 926	0
311747	1986	WOOD CR 334-40	COHO		1987	CLEAR CR 334-40	04/27/87	97	37	14851	459	65815	81125	5 463	1
311746	1986	WOOD CR 334-40	COHO		1987	WOOD CR 334-40	05/04/87	96	30	13459	561	66552	80572	5 986	14
1301020714	1992	TOKLAT R 334-40	CHUM	FINGERLING	1993	SUSHANA R 334-40	05/19/93	98 8	1	9163	111	0	9274	1.012	14
1301020715	1992	TOKLAT R 334-40	CHUM	FINGERLING	1993	SUSHANA R 334-40	05/19/93	95 2	1	8458	426	0	8884	1 05	5
1301020801	1992	TOKLAT R 334-40	CHUM	FINGERLING	1993	SUSHANA R 334-40	05/19/93	79 4	1	6464	1677	0	8141	1 259	15
1301020802	1992	TOKLAT R 334-40	CHUM	FINGERLING	1993	SUSHANA R 334-40	05/19/93	97 2	1	9376	270	0	9646	1 028	12
1301020803	1992	TOKLAT R 334-40	CHUM	FINGERLING	1993	SUSHANA R 334-40	05/19/93	95 9	1	9182	393	0	9575	1 042	15
1301020804	1992	TOKLAT R 334-40	CHUM	FINGERLING	1993	SUSHANA R 334-40	05/19/93	94 5	1	8766	510	0	9276	1 058	4
1301020805	1992	TOKLAT R 334-40	CHUM	FINGERLING	1993	SUSHANA R 334-40	05/19/93	94 9	1	8785	472	0	9257	1 053	15
1301020806	1992	TOKLAT R 334-40	CHUM	FINGERLING	1993	SUSHANA R 334-40	05/19/93	85 7	1	8126	1356	0	9482	1 166	15
1301020807	1992	TOKLAT R 334-40	CHUM	FINGERLING	1993	SUSHANA R 334-40	05/19/93	96 4	1	9140	341	0	9481	1.037	15
1301020808	1992	TOKLAT R 334-40	CHUM	FINGERLING	1993	SUSHANA R 334-40	05/19/93	97 1	1	8696	260	0	8956	1 029	20
1301010412	1992	TOKLAT R 334-40	CHUM	FINGERLING	1993	SUSHANA R 334-40	05/19/93			Unknown			Unknown		14
000000*5	1993	TOKLAT R 334-40	CHUM	PRESMOLT	1994	SUSHANA R 334-40	04/19/94	93	3	12282	924	0	13206	1 075	1
1301030301	1993	TOKLAT R 334-40	CHUM	PRESMOLT	1994	SUSHANA R 334-40	04/19/94	93	3	138140	10398	32128	180666	1 307	12
1301030309	1994	TOKLAT R 334-40	CHUM	PRESMOLT	1995	SUSHANA R 334-40	04/23/95	88 4	1	91301	11981	0	103282	1 131	1
1301030310	1994	TOKLAT R 334-40	CHUM	PRESMOLT	1995	SUSHANA R 334-40	04/23/95	97 3	7	116600	3236	0	119836	1 027	3
1301030311	1994	TOKLAT R 334-40	CHUM	PRESMOLT	1995	SUSHANA R 334-40	04/23/95	99 4	3	100854	609	0	101463	1 006	5
1301031008	1995	TOKLAT R 334-40	CHUM	FINGERLING	1996	SUSHANA R 334-40	04/19/96	96	1	179364	7474	0	186838	1 041	

All Coded Wire Tagging application activities were conducted at Clear Hatchery, Alaska by ADF&G.

Table 7. Summary of releases of juvenile chinook salmon from the Whitehorse Rapids Fish Hatchery, 1985 - 1997

Release Location	Release Date	Code	# Tagged & Clipped	Adipose Clipped Only	%Tag-Loss	Total Clipped	Weight (grams)	Total Unclipped	Total Released
Michie	25-May-85	023248	26670	518					
Michie	25-May-85	023226	28269	518					
Michie	25-May-85	023247	43325	518					
Wolf	1985	no-clip	0	0		0		10520	10520
SUM			98264	1555					
Michie		023731							
Wolf	1985	no-clip	0	0		0		5720	5720
SUM									
Michie	05-Jun-87	024812	47644	1361	0.028	49005	2.5	9598	58603
Michie	05-Jun-87	024813	49344	808	0.016	50152	2.5	9141	59293
Michie	05-Jun-87	024814	51888	559	0.011	52447	2.5	9422	61869
Michie	05-Jun-87	024815	43367	2066	0.045	45433	2.5	7868	53301
Michie	05-Jun-87	024258	25945	245	0.009	26190	2.5	4171	30361
Wolf	30-May-87	024259	26752	123	0.005	26875	2.5	422	27297
SUM			244940	5162		250102		40622	290724
Michie	10-Jun-88	025549	77670	1991		79661	2.8	84903	164564
Michie	10-Jun-88	025550	78013	1592		79605	2.7	85288	164893
Wolf	05-Jun-88	no-clip	0	0		0		25986	25986
SUM			155683	3583		159266		196177	355443
Wolf	1989	no-clip	0	0		0		22388	22388
Michie	06-Jun-89	026004	26161	326	0.015	26487	2.3	0	26487
Michie	06-Jun-89	026005	24951	128	0.004	25079	2.3	0	25079
Michie	06-Jun-89	026006	25098	291	0.018	25389	2.4	0	25389
Michie	06-Jun-89	026007	25233	156	0.0008	25389	2.2	118112	143501
Fishway	06-Jun-89	026008	25194	357	0.013	25551	2.7	0	25551
Fishway	06-Jun-89	026009	25190	351	0.0125	25541	2.7	0	25541
SUM			151827	1609		153436		118112	271548
Wolf	06-Jun-90	no-clip	0	0		0		11969	11969
Michie	02-Jun-90	020238	24555	501	0.02	25056	2.3	0	25056
Michie	02-Jun-90	020239	24345	753	0.03	25098	2.3	0	25098
Fishway	02-Jun-90	020260	24508	501	0.0200	25009	2.2	0	25009
Fishway	02-Jun-90	020263	25113	254	0.01	25367	2.2	0	25367
SUM			98521	2009		100530		11969	112499
Wolf	08-Jun-91	180322	49477	793	0.015	50270	2.3	0	50270
Fishway	06-Jun-91	180323	52948	193	0.0025	53141	2.3	0	53141
Michie	06-Jun-91	180324	50020	176	0.0025	50196	2.3	87348	137544
SUM			152445	1162		153607		87348	240955
Wolf	04-Jun-92	180829	48239	0	0	48239	2.4	0	48239
Fishway	04-Jun-92	180828	49356	99	0.002	49455	2.3	0	49455
Michie	04-Jun-92	180830	52946	643	0.012	53589	2.2	249166	302755
SUM			150541	742		151283		249166	400449
Wolf	06-Jun-93	181215	50248	0	0	50248	2.3	0	50248
Fishway	06-Jun-93	181216	49957	434	0.009	50391	2.3	0	50391
Michie	06-Jun-93	181217	50169	0	0	50169	2.3	290647	340816
SUM			150374	434		150808		290647	441455
Wolf	02-Jun-94	181427	50155	270	0.0053	50425	2.3	0	50425
Michie	02-Jun-94	181428	50210	127	0.0002	50337	2.3	158780	209117
Fishway	02-Jun-94	181429	50415	125	0.0002	50540	2.3	0	50540
SUM			150780	522		151302		158780	310082
Wolf	06-Jun-95	181246	10067	164	0.0163	10231	1.67	0	10231
Wolf	06-Jun-95	181247	9122	0	0	9122	1.53	0	9122
Michie	06-Jun-95	181826	25231	337	0.0134	25568	2.47	4552	30120
Michie	06-Jun-95	181827	25187	141	0.0056	25328	2.33	0	25328
SUM			69607			70249		4552	74801
Wolf	26-May-96	18748	10131	102	0.001	10233	2.3	0	10233
Fox	4-Jun-96	182823	35452	0	0	35452	2.43		35452
Byng	4-Jun-96	181041	25263	516	0.002	25779	2.37		25779
Michie	5-Jun-96	183345	50082	1022	0.002	51104	2.51		51104
Michie	5-Jun-96	183346	50260	508	0.001	50768	2.43		50768
Michie	5-Jun-96	183347	49985	505	0.001	50490	2.32		50490
Judas	4-Jun-96	183348	49798	1016	0.002	50814	2.43		50814
McClintock	4-Jun-96	183349	49991	302	0.001	50293	2.27		50293
SUM			320962			324933		0	324933
Wolf	1-Jun-97	182325	14850	150	0.01	15000	2.97	0	15000
Wolf	1-Jun-97	182326	20334	0	0.00	20334	2.26		20334
Wolf	8-Jun-97	182906	10158	0	0.00	10158	2.77		10158
Fox	11-Jun-97	182554	25242	0	0.00	25242	2.26		25242
Fox	5-Jun-97	182555	24995	253	0.01	25248	2.77		25248
Byng	11-Jun-97	182907	10029	0	0.00	10029	2.15		10029
Byng	11-Jun-97	182905	10155	0	0.00	10155	2.56		10155
Michie	11-Jun-97	182859	49657	502	0.01	50159	2.56		50159
Michie	11-Jun-97	182860	50130	0	0.00	50130	2.07		50130
Judas	7-Jun-97	182327	19951	202	0.01	20153	2.17		20153
Judas	11-Jun-97	182553	25146	0	0.00	25146	2.25		25146
McClintock	11-Jun-97	182551	25399	0	0.00	25399	2.07		25399
McClintock	11-Jun-97	182552	24792	251	0.01	25043	2.97		25043
SUM			310838			312196		0	312196

Non-CWT groups not recorded, 1985-1986.

* release year = brood year + 1

Table 8. Summary of releases of juvenile chinook salmon from Yukon Territory in-stream incubation/rearing sites, 1991-1997.

PROJECT	SPECIES	BR YR	STOCK	MARK	STAGE	RELEASE SITE	START DATE	END DATE	# TAGGED	# AD ONLY	# UNMARKED	TOTAL REL.	WT. (GM)
Klondike R, Nor	Chinook	1990	Tatchun R	0201010212	Spring Fry	Tatchun R	91/06/28	91/06/28	13593	21	650	14264	0 74
Klondike R, Nor	Chinook	1990	Tatchun R	0201010209	Spring Fry	Tatchun R	91/06/28	91/06/28	15247	173	750	16170	0 74
Klondike R, Nor	Chinook	1991	Tatchun R	180645	Spring Fry	Tatchun R	/ /	92/08/31	11734	0	817	12551	2 47
Klondike R, Nor	Chinook	1991	Tatchun R	023356	Spring Fry	Tatchun R	/ /	92/08/31	6453	0	852	7305	2 47
Klondike R, Nor	Chinook	1991	Tatchun R	180644	Spring Fry	Tatchun R	/ /	92/08/31	11585	0	320	11905	2 47
Klondike R, Nor	Chinook	1991	Yukon R	NOCN9146	Spring Fry	Pothole Lk	92/06/	92/06/	0	0	1500	1500	0
Klondike R, Nor	Chinook	1993	Klondike R Nor	0201010503	Spring Fry	Klondike R Nor	94/06/30	94/06/30	6174	10	54	6238	0 88
Klondike R, Nor	Chinook	1993	Tatchun R	0201010407	Spring Fry	Tatchun R	94/06/30	94/06/30	12077	246	71	12394	0 99
Klondike R, Nor	Chinook	1993	Tatchun R	0201010505	Spring Fry	Tatchun R	94/06/30	94/06/30	9982	0	61	10043	0 99
Klondike R, Nor	Chinook	1994	Klondike R Nor	0201010603	Spring Fry	Klondike R Nor	95/07/04	95/07/04	2159	11	190	2360	0 75
Klondike R, Nor	Chinook	1994	Klondike R Nor	0201010602	Spring Fry	Klondike R Nor	95/07/04	95/07/04	1809	16	56	1881	0 75
Klondike R, Nor	Chinook	1994	Tatchun R	0201010511	Spring Fry	Tatchun R	95/07/04	95/07/04	12431	100	686	13217	0 81
Klondike R, Nor	Chinook	1994	Tatchun R	0201010515	Spring Fry	Tatchun R	95/07/04	95/07/04	2490	33	177	2700	0.81
Klondike R, Nor	Chinook	1994	Tatchun R	0201010601	Spring Fry	Tatchun R	95/07/04	95/07/04	1476	19	155	1650	0.81
Klondike R, Nor	Chinook	1994	Tatchun R	0201010513	Spring Fry	Tatchun R	95/07/04	95/07/04	11649	238	413	12300	0.81
Klondike R, Nor	Chinook	1995	Klondike R Nor	0201010408	Spring Fry	Klondike R Nor	96/06/22	96/06/22	11423	1707	0	13130	0.76
Mayo River	Chinook	1991	Mayo R	NOCN9147	Spring Fry	Mayo R	92/06/	92/06/	0	0	13000	13000	0
Mayo River	Chinook	1992	Mayo R	NOCN9292	Spring Fry	Mayo R	93/07/	93/07/	0	0	500	500	0
McIntyre Cr	Chinook	1990	Takhini R	023355	Fall Fry 5-8 gm	Takhini R	91/09/13	91/09/13	7967	80	39	8086	3 2
McIntyre Cr	Chinook	1990	Takhini R	023354	Fall Fry 5-8 gm	Takhini R	91/09/13	91/09/13	10789	109	101	10999	3 2
McIntyre Cr	Chinook	1991	Takhini R	0201010308	Spring Fry	Flat Cr	/ /	92/07/04	12141	143	3425	15709	0 98
McIntyre Cr	Chinook	1991	Takhini R	0201010309	Spring Fry	Flat Cr	/ /	92/07/04	13102	466	1398	14966	0 98
McIntyre Cr	Chinook	1991	Takhini R	0201010310	Spring Fry	Flat Cr	/ /	92/07/04	4955	261	601	5817	0 98
McIntyre Cr	Chinook	1992	Klondike R Nor	0201010404	Spring Fry	Klondike R Nor	93/07/01	93/07/01	12832	240	144	13216	1 14
McIntyre Cr	Chinook	1992	Klondike R Nor	0201010405	Spring Fry	Klondike R Nor	93/07/01	93/07/01	7548	256	167	7969	1 14
McIntyre Cr	Chinook	1992	Takhini R	023424	Spring Fry	Flat Cr	93/08/17	93/08/17	9532	823	95	10450	2 71
McIntyre Cr	Chinook	1992	Takhini R	023423	Spring Fry	Flat Cr	93/08/17	93/08/17	9822	850	218	10890	2 71
McIntyre Cr	Chinook	1992	Takhini R	181454	Spring Fry	Flat Cr	93/08/17	93/08/17	10925	567	227	11719	2 71
McIntyre Cr	Chinook	1992	Takhini R	181453	Spring Fry	Flat Cr	93/08/17	93/08/17	10658	865	226	11749	2 71
McIntyre Cr	Chinook	1992	Takhini R	020217	Spring Fry	Flat Cr	93/08/17	93/08/17	2291	114	37	2442	2 71
McIntyre Cr	Chinook	1992	Takhini R	023422	Spring Fry	Flat Cr	93/08/17	93/08/17	10355	314	40	10709	2.71
McIntyre Cr	Chinook	1992	Tatchun R	0201010402	Spring Fry	Tatchun R	93/06/17	93/06/17	4654	633	335	5622	0 76
McIntyre Cr	Chinook	1993	Takhini R	181751	Spring Fry	Flat Cr	94/08/26	94/08/31	7410	46	222	7678	2 6
McIntyre Cr	Chinook	1993	Takhini R	181750	Spring Fry	Flat Cr	94/08/26	94/08/31	11227	40	87	11354	2 6
McIntyre Cr	Chinook	1993	Takhini R	181749	Spring Fry	Flat Cr	94/08/26	94/08/31	11071	159	142	11372	2 6
McIntyre Cr	Chinook	1993	Takhini R	181748	Spring Fry	Flat Cr	94/08/26	94/08/31	11375	0	104	11479	2 6
McIntyre Cr	Chinook	1993	Takhini R	181752	Spring Fry	Flat Cr	94/08/26	94/08/31	10668	21	198	10887	2 6
McIntyre Cr	Chinook	1993	Takhini R	020216	Spring Fry	Takhini R	94/08/30	94/08/30	9343	271	36	9650	2 8
McIntyre Cr	Chinook	1993	Takhini R	020163	Spring Fry	Takhini R	94/08/30	94/08/30	10899	222	62	11183	2 8
McIntyre Cr	Chinook	1994	Takhini R	0201010415	Spring Fry	Takhini R	95/08/14	95/08/14	9887	0	410	10297	2 2
McIntyre Cr	Chinook	1994	Takhini R	0201010413	Spring Fry	Takhini R	95/08/14	95/08/14	14452	0	365	14817	2 2
McIntyre Cr	Chinook	1994	Takhini R	0201010412	Spring Fry	Flat Cr	95/08/14	95/08/14	14193	59	281	14533	2 2
McIntyre Cr	Chinook	1994	Takhini R	0201010414	Spring Fry	Flat Cr	95/08/14	95/08/14	13586	130	295	14011	2 2
McIntyre Cr	Chinook	1995	Takhini R	0201010508	Spring Fry	Takhini R	96/08/12	96/08/12	15731	251	496	16478	2 1
McIntyre Cr	Chinook	1995	Takhini R	0201010509	Spring Fry	Takhini R	96/08/12	96/08/12	8085	41	293	8419	2 1
McIntyre Cr	Chinook	1995	Takhini R	0201010510	Spring Fry	Flat Cr	96/08/07	96/08/07	10727	65	170	10962	2 01
McIntyre Cr	Chinook	1995	Tatchun R	0201010210	Spring Fry	Tatchun R	96/06/27	96/06/27	14530	49	62	14641	0 81
McIntyre Cr	Chinook	1995	Tatchun R	0201010211	Spring Fry	Tatchun R	96/06/27	96/06/27	13526	91	294	13911	0 81
McIntyre Cr	Chinook	1996	Takhini R	0201010614	Spring Fry	Flat Cr	97/07/02	97/07/04	15622	158	382	16162	0 8
McIntyre Cr	Chinook	1996	Takhini R	0201010406	Spring Fry	Flat Cr	97/07/02	97/07/04	14845	37	280	15162	0 8
McIntyre Cr	Chinook	1996	Tatchun R	0201010703	Spring Fry	Tatchun R	97/06/27	97/07/	1521	15	148	1684	1

ATTACHMENT I

HISTORICAL YUKON RIVER SALMON CATCH AND ESCAPEMENT DATABASE

Attachment Table 1. Alaskan and Canadian total utilization of Yukon River chinook, chum, and coho salmon, 1903-1997.

Year	Alaska [a,b]			Canada [c]			Total		
	Chinook	Other Salmon	Total	Chinook	Other Salmon	Total	Chinook	Other Salmon	Total
1903				4,666		4,666	4,666		4,666
1904									
1905									
1906									
1907									
1908				7,000		7,000	7,000		7,000
1909				9,238		9,238	9,238		9,238
1910									
1911									
1912									
1913				12,133		12,133	12,133		12,133
1914				12,573		12,573	12,573		12,573
1915				10,466		10,466	10,466		10,466
1916				9,566		9,566	9,566		9,566
1917									
1918	12,239	1,500,065	1,512,304	7,066		7,066	19,305	1,500,065	1,519,370
1919	104,822	738,790	843,612	1,800		1,800	106,622	738,790	845,412
1920	78,467	1,015,655	1,094,122	12,000		12,000	90,467	1,015,655	1,106,122
1921	69,646	112,098	181,744	10,840		10,840	80,486	112,098	192,584
1922	31,825	330,000	361,825	2,420		2,420	34,245	330,000	364,245
1923	30,893	435,000	465,893	1,833		1,833	32,726	435,000	467,726
1924	27,375	1,130,000	1,157,375	4,560		4,560	31,935	1,130,000	1,161,935
1925	15,000	259,000	274,000	3,900		3,900	18,900	259,000	277,900
1926	20,500	555,000	575,500	4,373		4,373	24,873	555,000	579,873
1927		520,000	520,000	5,366		5,366	5,366	520,000	525,366
1928		670,000	670,000	5,733		5,733	5,733	670,000	675,733
1929		537,000	537,000	5,226		5,226	5,226	537,000	542,226
1930		633,000	633,000	3,660		3,660	3,660	633,000	636,660
1931	26,693	565,000	591,693	3,473		3,473	30,166	565,000	595,166
1932	27,899	1,092,000	1,119,899	4,200		4,200	32,099	1,092,000	1,124,099
1933	28,779	603,000	631,779	3,333		3,333	32,112	603,000	635,112
1934	23,365	474,000	497,365	2,000		2,000	25,365	474,000	499,365
1935	27,665	537,000	564,665	3,466		3,466	31,131	537,000	568,131
1936	43,713	560,000	603,713	3,400		3,400	47,113	560,000	607,113
1937	12,154	346,000	358,154	3,746		3,746	15,900	346,000	361,900
1938	32,971	340,450	373,421	860		860	33,831	340,450	374,281
1939	28,037	327,650	355,687	720		720	28,757	327,650	356,407
1940	32,453	1,029,000	1,061,453	1,153		1,153	33,606	1,029,000	1,062,606
1941	47,608	438,000	485,608	2,806		2,806	50,414	438,000	488,414
1942	22,487	197,000	219,487	713		713	23,200	197,000	220,200
1943	27,650	200,000	227,650	609		609	28,259	200,000	228,259
1944	14,232		14,232	986		986	15,218		15,218
1945	19,727		19,727	1,333		1,333	21,060		21,060
1946	22,782		22,782	353		353	23,135		23,135
1947	54,026		54,026	120		120	54,146		54,146
1948	33,842		33,842				33,842		33,842
1949	36,379		36,379				36,379		36,379
1950	41,808		41,808				41,808		41,808
1951	56,278		56,278				56,278		56,278
1952	38,637	10,868	49,505				38,637	10,868	49,505
1953	58,859	385,977	444,836				58,859	385,977	444,836
1954	64,545	14,375	78,920				64,545	14,375	78,920
1955	55,925		55,925				55,925		55,925
1956	62,208	10,743	72,951				62,208	10,743	72,951
1957	63,623		63,623				63,623		63,623
1958	75,625	337,500	413,125	11,000	1,500	12,500	86,625	339,000	425,625
1959	78,370		78,370	8,434	3,098	11,532	86,804	3,098	89,902
1960	67,597		67,597	9,653	15,608	25,261	77,250	15,608	92,858

continued

Attachment Table 1. (page 2 of 2).

Year	Alaska [a,b]			Canada [c]			Total		
	Chinook	Other Salmon	Total	Chinook	Other Salmon	Total	Chinook	Other Salmon	Total
1961	141,152	461,597	602,749	13,246	9,076	22,322	154,398	470,673	625,071
1962	105,844	434,663	540,507	13,937	9,436	23,373	119,781	444,099	563,880
1963	141,910	429,396	571,306	10,077	27,696	37,773	151,987	457,092	609,079
1964	109,818	504,420	614,238	7,408	12,187	19,595	117,226	516,607	633,833
1965	134,706	484,587	619,293	5,380	11,789	17,169	140,086	496,376	636,462
1966	104,887	309,502	414,389	4,452	13,192	17,644	109,339	322,694	432,033
1967	146,104	352,397	498,501	5,150	16,961	22,111	151,254	369,358	520,612
1968	118,632	270,818	389,450	5,042	11,633	16,675	123,674	282,451	406,125
1969	105,027	424,399	529,426	2,624	7,776	10,400	107,651	432,175	539,826
1970	93,019	585,760	678,779	4,663	3,711	8,374	97,682	589,471	687,153
1971	136,191	547,448	683,639	6,447	16,911	23,358	142,638	564,359	706,997
1972	113,098	461,617	574,715	5,729	7,532	13,261	118,827	469,149	587,976
1973	99,670	779,158	878,828	4,522	10,135	14,657	104,192	789,293	893,485
1974	118,053	1,229,678	1,347,731	5,631	11,646	17,277	123,684	1,241,324	1,365,008
1975	76,883	1,307,037	1,383,920	6,000	20,600	26,600	82,883	1,327,637	1,410,520
1976	105,582	1,026,908	1,132,490	5,025	5,200	10,225	110,607	1,032,108	1,142,715
1977	114,494	1,090,758	1,205,252	7,527	12,479	20,006	122,021	1,103,237	1,225,258
1978	129,988	1,615,312	1,745,300	5,881	9,566	15,447	135,869	1,624,878	1,760,747
1979	159,232	1,596,133	1,755,365	10,375	22,084	32,459	169,607	1,618,217	1,787,824
1980	197,665	1,730,960	1,928,625	22,846	23,718 [d]	46,564	220,511	1,754,678	1,975,189
1981	188,477	2,097,871	2,286,348	18,109	22,781 [d]	40,890	206,586	2,120,652	2,327,238
1982	152,808	1,265,457	1,418,265	17,208	16,091 [d]	33,299	170,016	1,281,548	1,451,564
1983	198,436	1,678,597	1,877,033	18,952	29,490 [d]	48,442	217,388	1,708,087	1,925,475
1984	162,683	1,548,101	1,710,784	16,795	29,767 [d]	46,562	179,478	1,577,868	1,757,346
1985	187,327	1,657,984	1,845,311	19,301	41,515 [d]	60,816	206,628	1,699,499	1,906,127
1986	146,004	1,758,825	1,904,829	20,364	14,843 [d]	35,207	166,368	1,773,668	1,940,036
1987	188,386	1,246,176	1,434,562	17,614	44,786 [d]	62,400	206,000	1,290,962	1,496,962
1988	148,421	2,311,196	2,459,617	21,427	33,915 [d]	55,342	169,848	2,345,111	2,514,959
1989	157,606	2,281,566	2,439,172	17,944	23,490 [d]	41,434	175,550	2,305,056	2,480,606
1990	149,433	1,053,351	1,202,784	19,227	34,302 [d]	53,529	168,660	1,087,653	1,256,313
1991	154,651	1,335,111	1,489,762	20,607	35,653 [d]	56,260	175,258	1,370,764	1,546,022
1992	168,191	863,575	1,031,766	17,903	21,310 [d]	39,213	186,094	884,885	1,070,979
1993	163,078	342,871	505,949	16,611	14,150 [d]	30,761	179,689	357,021	536,710
1994	172,315	577,250	749,565	21,218	38,340	59,558	193,533	615,590	809,123
1995	177,663	1,437,837	1,615,500	20,887	45,600	66,487	198,550	1,483,437	1,681,987
1996	138,562	1,117,481	1,256,043	19,612	24,354	43,966	158,174	1,141,835	1,300,009
1997 [f]	116,401 [g]	324,316 [g]	440,717	16,100	13,321	29,421	132,501	337,637	470,138
Average									
1903-86	78,529	729,010	676,202	6,962	15,104	13,598	73,209	711,722	625,729
1987-91	159,699	1,645,480	1,805,179	19,364	34,429	53,793	179,063	1,679,909	1,858,972
1992-96	163,962	867,803	1,031,765	19,246	28,751	47,997	183,208	896,554	1,079,762

[a] Catch in number of salmon. Includes estimated number of salmon harvested for the commercial production of salmon roe.

[b] Commercial, subsistence, personal-use, and sport catches combined.

[c] Catch in number of salmon. Commercial, Aboriginal, domestic and sport catches combined.

[d] Includes the Old Crow Aboriginal fishery harvest of coho salmon.

[f] Data are preliminary.

[g] Does not include Alaskan subsistence, personal use and sport fish harvests as these harvest numbers are unavailable at this time.

Attachment Table 2. Alaskan and Canadian total utilization of Yukon River chinook and fall chum salmon, 1961-1997.

Year	Chinook			Fall Chum		
	Canada [a]	Alaska [b,c]	Total	Canada [a]	Alaska [b,c]	Total
1961	13,246	141,152	154,398	9,076	144,233	153,309
1962	13,937	105,844	119,781	9,436	140,401	149,837
1963	10,077	141,910	151,987	27,696	99,031 [d]	126,727
1964	7,408	109,818	117,226	12,187	128,707	140,894
1965	5,380	134,706	140,086	11,789	135,600	147,389
1966	4,452	104,887	109,339	13,192	122,548	135,740
1967	5,150	146,104	151,254	16,961	107,018	123,979
1968	5,042	118,632	123,674	11,633	97,552	109,185
1969	2,624	105,027	107,651	7,776	183,373	191,149
1970	4,663	93,019	97,682	3,711	265,096	268,807
1971	6,447	136,191	142,638	16,911	246,756	263,667
1972	5,729	113,098	118,827	7,532	188,178	195,710
1973	4,522	99,670	104,192	10,135	285,760	295,895
1974	5,631	118,053	123,684	11,646	383,552	395,198
1975	6,000	76,883	82,883	20,600	361,600	382,200
1976	5,025	105,582	110,607	5,200	228,717	233,917
1977	7,527	114,494	122,021	12,479	340,757	353,236
1978	5,881	129,988	135,869	9,566	331,250	340,816
1979	10,375	159,232	169,607	22,084	593,293	615,377
1980	22,846	197,665	220,511	22,218	466,087	488,305
1981	18,109	188,477	206,586	22,281	654,976	677,257
1982	17,208	152,808	170,016	16,091	357,084	373,175
1983	18,952	198,436	217,388	29,490	495,526	525,016
1984	16,795	162,683	179,478	29,267	383,055	412,322
1985	19,301	187,327	206,628	41,265	474,216	515,481
1986	20,364	146,004	166,368	14,543	303,485	318,028
1987	17,614	188,386	206,000	44,480	361,663 [d]	406,143
1988	21,427	148,421	169,848	33,565	319,677	353,242
1989	17,944	157,606	175,550	23,020	518,157	541,177
1990	19,227	149,433	168,660	33,622	316,478	350,100
1991	20,607	154,651	175,258	35,418	403,678	439,096
1992	17,903	168,191	186,094	20,815	128,031 [g]	148,846
1993	16,611	163,078	179,689	14,090	76,925 [d]	91,015
1994	21,218	172,315	193,533	38,008	131,217	169,225
1995	20,887	177,663	198,550	45,600	415,547	461,147
1996	19,612	138,562	158,174	24,354	238,686	263,040
1997 [f]	16,100	116,401 [h]	132,501	13,234	58,187 [h]	71,421
Average						
1961-86	10,104	134,142	144,245	15,953	289,148	305,101
1987-91	19,364	159,699	179,063	34,021	383,931	417,952
1992-96	19,246	163,962	183,208	28,573	198,081	226,655

[a] Catches in number of salmon. Includes commercial, Aboriginal, domestic, and sport catches combined.

[b] Catch in number of salmon. Includes estimated number of salmon harvested for the commercial production of salmon roe (see Bergstrom et al. 1992: 1990 Yukon Area AMR).

[c] Commercial, subsistence, personal-use, and sport catches combined.

[d] Commercial fishery did not operate within the Alaskan portion of the drainage.

[f] Data are preliminary.

[g] Commercial fishery operated only in District 6, the Tanana River.

[h] Does not include Alaskan subsistence, personal use and sport fish harvests as these harvest numbers are unavailable at this time.

Attachment Table 3. Alaskan catch of Yukon River chinook salmon, 1961-1997.

Year	Estimated Subsistence Use [a]	Harvest			
		Subsistence [b]	Commercial [c]	Sport [d]	Total
1961	21,488	21,488	119,664		141,152
1962	11,110	11,110	94,734		105,844
1963	24,862	24,862	117,048		141,910
1964	16,231	16,231	93,587		109,818
1965	16,608	16,608	118,098		134,706
1966	11,572	11,572	93,315		104,887
1967	16,448	16,448	129,656		146,104
1968	12,106	12,106	106,526		118,632
1969	14,000	14,000	91,027		105,027
1970	13,874	13,874	79,145		93,019
1971	25,684	25,684	110,507		136,191
1972	20,258	20,258	92,840		113,098
1973	24,317	24,317	75,353		99,670
1974	19,964	19,964	98,089		118,053
1975	13,045	13,045	63,838		76,883
1976	17,806	17,806	87,776		105,582
1977	17,581	17,581	96,757	156	114,494
1978	30,297	30,297	99,168	523	129,988
1979	31,005	31,005	127,673	554	159,232
1980	42,724	42,724	153,985	956	197,665
1981	29,690	29,690	158,018	769	188,477
1982	28,158	28,158	123,644	1,006	152,808
1983	49,478	49,478	147,910	1,048	198,436
1984	42,428	42,428	119,904	351	162,683
1985	39,771	39,771	146,188	1,368	187,327
1986	45,238	45,238	99,970	796	146,004
1987	53,124	53,124	134,760 [f]	502	188,386
1988	46,032	46,032	101,445	944	148,421
1989	51,062	51,062	105,491	1,053	157,606
1990	51,594	51,181	97,708	544	149,433
1991	48,311	46,773	107,105	773	154,651
1992	46,553	45,626	122,134	431	168,191
1993	66,261	65,701	95,682	1,695	163,078
1994	55,266	54,563	115,471	2,281	172,315
1995	50,258	48,934	126,204	2,525	177,663
1996	43,827	43,521	91,890	3,151	138,562
1997 [g]	[h]	[h]	116,401	[h]	116,401
Average					
1961-86	24,452	24,452	109,401	753	134,142
1987-91	50,025	49,634	109,302	763	159,699
1992-96	52,433	51,669	110,276	2,017	163,962

a Includes salmon harvested for subsistence purposes, and an estimate of the number of salmon carcasses harvested for the commercial production of salmon roe and used for subsistence. These data are only available since 1990.

b Includes salmon harvested for subsistence and personal use.

c Includes ADF&G test fish sales, fish sold in the round, and estimated numbers of female salmon commercially harvested for the production of salmon roe (see Bergstrom et al. 1992: 1990 Yukon Area AMR).

d Sport fish harvest for the Alaskan portion of the Yukon River drainage. The majority of this harvest is believed to have been taken within the Tanana River drainage (see Schultz et al. 1993: 1992 Yukon Area AMR).

f Includes 653 and 2,136 chinook salmon illegally sold in District 5 and 6 (Tanana River), respectively.

g Data are preliminary.

h Data are unavailable at this time.

Attachment Table 4. Canadian catch of Yukon River chinook salmon, 1961-1997.

Year	Mainstem Yukon River Harvest						Porcupine River Aboriginal Fishery Harvest	Total Canadian Harvest
	Commercial	Domestic	Aboriginal Fishery	Sport [a]	Combined Non-Commercial	Total		
1961	3,446		9,300		9,300	12,746	500	13,246
1962	4,037		9,300		9,300	13,337	600	13,937
1963	2,283		7,750		7,750	10,033	44	10,077
1964	3,208		4,124		4,124	7,332	76	7,408
1965	2,265		3,021		3,021	5,286	94	5,380
1966	1,942		2,445		2,445	4,387	65	4,452
1967	2,187		2,920		2,920	5,107	43	5,150
1968	2,212		2,800		2,800	5,012	30	5,042
1969	1,640		957		957	2,597	27	2,624
1970	2,611		2,044		2,044	4,655	8	4,663
1971	3,178		3,260		3,260	6,438	9	6,447
1972	1,769		3,960		3,960	5,729		5,729
1973	2,199		2,319		2,319	4,518	4	4,522
1974	1,808	406	3,342		3,748	5,556	75	5,631
1975	3,000	400	2,500		2,900	5,900	100	6,000
1976	3,500	500	1,000		1,500	5,000	25	5,025
1977	4,720	531	2,247		2,778	7,498	29	7,527
1978	2,975	421	2,485		2,906	5,881		5,881
1979	6,175	1,200	3,000		4,200	10,375		10,375
1980	9,500	3,500	7,546	300	11,346	20,846	2000	22,846
1981	8,593	237	8,879	300	9,416	18,009	100	18,109
1982	8,640	435	7,433	300	8,168	16,808	400	17,208
1983	13,027	400	5,025	300	5,725	18,752	200	18,952
1984	9,885	260	5,850	300	6,410	16,295	500	16,795
1985	12,573	478	5,800	300	6,578	19,151	150	19,301
1986	10,797	342	8,625	300	9,267	20,064	300	20,364
1987	10,864	330	6,069	300	6,699	17,563	51	17,614
1988	13,217	282	7,178	650	8,110	21,327	100	21,427
1989	9,789	400	6,930	300	7,630	17,419	525	17,944
1990	11,324	247	7,109	300	7,656	18,980	247	19,227
1991	10,906	227	9,011	300	9,538	20,444	163	20,607
1992	10,877	277	6,349	300	6,926	17,803	100	17,903
1993	10,350	243	5,576	300	6,119	16,469	142	16,611
1994	12,028	373	8,089	300	8,762	20,790	428	21,218
1995	11,146	300	7,945	700	8,945	20,091	796	20,887
1996	10,164	141	8,451	790	9,382	19,546	66	19,612
1997 [b]	5,311	121	8,942	1,230	10,293	15,604	496	16,100
1961-86	4,930	701	4,536	300	4,967	9,897	234	10,104
1987-91	11,220	297	7,259	370	7,927	19,147	217	19,364
1992-96	10,913	267	7,282	478	8,027	18,940	306	19,246

[a] Sport fish harvest unknown prior to 1980.

[b] Data are preliminary.

Attachment Table 5. Alaskan catch of Yukon River summer chum salmon, 1961-1997.

Year	Estimated Subsistence Use [a]	Harvest			
		Subsistence [b]	Commercial [c]	Sport [d]	Total
1961	305,317 [f]	305,317 [f]	0		305,317
1962	261,856 [f]	261,856 [f]	0		261,856
1963	297,094 [f]	297,094 [f]	0		297,094
1964	361,080 [f]	361,080 [f]	0		361,080
1965	336,848 [f]	336,848 [f]	0		336,848
1966	154,508 [f]	154,508 [f]	0		154,508
1967	206,233 [f]	206,233 [f]	10,935		217,168
1968	133,880 [f]	133,880 [f]	14,470		148,350
1969	156,191 [f]	156,191 [f]	61,966		218,157
1970	166,504 [f]	166,504 [f]	137,006		303,510
1971	171,487 [f]	171,487 [f]	100,090		271,577
1972	108,006 [f]	108,006 [f]	135,668		243,674
1973	161,012 [f]	161,012 [f]	285,509		446,521
1974	227,811 [f]	227,811 [f]	589,892		817,703
1975	211,888 [f]	211,888 [f]	710,295		922,183
1976	186,872 [f]	186,872 [f]	600,894		787,766
1977	159,502	159,502	534,875	316	694,693
1978	197,144	171,383	1,077,987	451	1,249,821
1979	196,187	155,970	819,533	328	975,831
1980	272,398	167,705	1,067,715	483	1,235,903
1981	208,284	117,629	1,279,701	612	1,397,942
1982	260,969	117,413	717,013	780	835,206
1983	240,386	149,180	995,469	998	1,145,647
1984	230,747	166,630	866,040	585	1,033,255
1985	264,828	157,744	934,013	1,267	1,093,024
1986	290,825	182,337	1,188,850	895	1,372,082
1987	275,914	174,940	622,541	846	798,327
1988	311,724	198,806	1,620,269	1,037	1,820,112
1989	249,582	169,046	1,463,345	2,131	1,634,522
1990	201,839 [g]	117,436	525,440	472	643,348
1991	275,673 [g]	118,540	662,036	1,037	781,613
1992	261,448 [g]	125,497	545,544	1,308	672,349
1993	139,541 [g]	106,728	141,985	564	249,277
1994	245,973 [g]	132,510	261,953	350	394,813
1995	221,308 [g]	119,503	824,487	1,174	945,164
1996	248,856 [g]	103,408	684,083	1,854	789,345
1997 [h]	[j]	[j]	230,809	[j]	230,809
Average					
1961-86	221,841	192,003	466,459	672	658,720
1987-91	262,946	155,754	978,726	1,105	1,135,584
1992-96	223,425	117,529	491,610	1,050	610,190

[a] Includes salmon harvested for subsistence purposes, and an estimate of the number of salmon carcasses harvested for the commercial production of salmon roe and used for subsistence. These data are only available since 1990.

[b] Includes salmon harvested for subsistence and personal use.

[c] Includes ADF&G test fish sales, fish sold in the round, and estimated numbers of female salmon commercially harvested for the production of salmon roe (see Bergstrom et al. 1992: 1990 Yukon Area AMR).

[d] Includes both summer and fall chum salmon sport fish harvest within the Alaskan portion of the Yukon River drainage. The majority of this harvest is believed to have been taken within the Tanana River drainage.

[f] Catches estimated because catches of species other than chinook salmon were not differentiated.

[g] Subsistence harvest, summer chum salmon commercially harvested for the production of salmon roe in District 5 and 6, and the estimated subsistence use of commercially-harvested summer chum salmon in District 4.

[h] Data are preliminary.

[j] Data are unavailable at this time.

Attachment Table 6. Alaskan catch of Yukon River fall chum salmon, 1961-1997.

Year	Estimated Subsistence Use [a]	Harvest		
		Subsistence [b]	Commercial [c]	Total [d]
1961	101,772 [f,g]	101,772 [f]	42,461	144,233
1962	87,285 [f,g]	87,285 [f]	53,116	140,401
1963	99,031 [f,g]	99,031 [f]	0	99,031
1964	120,360 [f,g]	120,360 [f]	8,347	128,707
1965	112,283 [f,g]	112,283 [f]	23,317	135,600
1966	51,503 [f,g]	51,503 [f]	71,045	122,548
1967	68,744 [f,g]	68,744 [f]	38,274	107,018
1968	44,627 [f,g]	44,627 [f]	52,925	97,552
1969	52,063 [f,g]	52,063 [f]	131,310	183,373
1970	55,501 [f,g]	55,501 [f]	209,595	265,096
1971	57,162 [f,g]	57,162 [f]	189,594	246,756
1972	36,002 [f,g]	36,002 [f]	152,176	188,178
1973	53,670 [f,g]	53,670 [f]	232,090	285,760
1974	93,776 [f,g]	93,776 [f]	289,776	383,552
1975	86,591 [f,g]	86,591 [f]	275,009	361,600
1976	72,327 [f,g]	72,327 [f]	156,390	228,717
1977	82,771 [g]	82,771 [g]	257,986	340,757
1978	94,867 [g]	84,239 [g]	247,011	331,250
1979	233,347	214,881	378,412	593,293
1980	172,657	167,637	298,450	466,087
1981	188,525	177,240	477,736	654,976
1982	132,897	132,092	224,992	357,084
1983	192,928	187,864	307,662	495,526
1984	174,823	172,495	210,560	383,055
1985	206,472	203,947	270,269	474,216
1986	164,043	163,466	140,019	303,485
1987	361,663	361,663 [h]	0	361,663
1988	158,694	155,467	164,210	319,677
1989	230,978	216,229	301,928	518,157
1990	185,244	173,076	143,402	316,478
1991	168,890	145,524	258,154	403,678
1992	110,903	107,602	20,429 [k]	128,031
1993	76,925	76,925	0	76,925
1994	127,586	123,218	7,999	131,217
1995	163,693	131,369	284,178	415,547
1996	146,154	129,251	109,435	238,686
1997 [j]	[m]	[m]	58,187	58,187
Average				
1961-86	109,078	106,897	182,251	289,148
1987-91	221,094	210,392	173,539	383,931
1992-96	125,052	113,673	84,408	198,081

[a] Includes salmon harvested for subsistence purposes, and an estimate of the number of salmon carcasses harvested for the commercial production of salmon roe and used for subsistence. These data are only available since 1990.

[b] Includes salmon harvested for subsistence and personal use.

[c] Includes ADF&G test fish sales, fish sold in the round, and estimated numbers of female salmon commercially harvested for production of salmon roe (see Bergstrom et al. 1992: 1990 Yukon Area AMR).

[d] Does not include sport-fish harvest. The majority of the sport-fish harvest is believed to be taken in the Tanana River drainage. Sport fish division does not differentiate between the two races of chum salmon. However, the majority of this harvest is believed to be summer chum salmon.

[f] Catches estimated because catches of species other than chinook salmon were not differentiated.

[g] Minimum estimates because surveys were conducted prior to the end of the fishing season.

[h] Includes an estimated 95,768 and 119,168 fall chum salmon illegally sold in Districts 5 and 6 (Tanana River), respectively.

[j] Data are preliminary.

[k] Commercial fishery operated only in District 6, the Tanana River.

[m] Data are unavailable at this time.

Attachment Table 7. Canadian catch of Yukon River fall chum salmon, 1961-1997.

Year	Mainstem Yukon River Harvest					Porcupine River Aboriginal Fishery Harvest	Total Canadian Harvest
	Commercial	Domestic	Aboriginal Fishery	Combined Non-Commercial	Total		
1961	3,276		3,800	3,800	7,076	2,000	9,076
1962	936		6,500	6,500	7,436	2,000	9,436
1963	2,196		5,500	5,500	7,696	20,000	27,696
1964	1,929		4,200	4,200	6,129	6,058	12,187
1965	2,071		2,183	2,183	4,254	7,535	11,789
1966	3,157		1,430	1,430	4,587	8,605	13,192
1967	3,343		1,850	1,850	5,193	11,768	16,961
1968	453		1,180	1,180	1,633	10,000	11,633
1969	2,279		2,120	2,120	4,399	3,377	7,776
1970	2,479		612	612	3,091	620	3,711
1971	1,761		150	150	1,911	15,000	16,911
1972	2,532			0	2,532	5,000	7,532
1973	2,806		1,129	1,129	3,935	6,200	10,135
1974	2,544	466	1,636	2,102	4,646	7,000	11,646
1975	2,500	4,600	2,500	7,100	9,600	11,000	20,600
1976	1,000	1,000	100	1,100	2,100	3,100	5,200
1977	3,990	1,499	1,430	2,929	6,919	5,560	12,479
1978	3,356	728	482	1,210	4,566	5,000	9,566
1979	9,084	2,000	11,000	13,000	22,084		22,084
1980	9,000	4,000	3,218	7,218	16,218	6,000	22,218
1981	15,260	1,611	2,410	4,021	19,281	3,000	22,281
1982	11,312	683	3,096	3,779	15,091	1,000	16,091
1983	25,990	300	1,200	1,500	27,490	2,000	29,490
1984	22,932	535	1,800	2,335	25,267	4,000	29,267
1985	35,746	279	1,740	2,019	37,765	3,500	41,265
1986	11,464	222	2,200	2,422	13,886	657	14,543
1987	40,591	132	3,622	3,754	44,345	135	44,480
1988	30,263	349	1,882	2,231	32,494	1,071	33,565
1989	17,549	100	2,462	2,562	20,111	2,909	23,020
1990	27,537	0	3,675	3,675	31,212	2,410	33,622
1991	31,404	0	2,438	2,438	33,842	1,576	35,418
1992	18,576	0	304	304	18,880	1,935	20,815
1993	7,762	0	4,660	4,660	12,422	1,668	14,090
1994	30,035	0	5,319	5,319	35,354	2,654	38,008
1995	39,012	0	1,099	1,099	40,111	5,489	45,600
1996	20,069	0	1,260	1,260	21,329	3,025	24,354
1997 [a]	7,874	0	1,216	1,216	9,090	4,144	13,234
Average							
1961-86	7,054	1,379	2,539	3,130	10,184	5,999	15,953
1987-91	29,469	116	2,816	2,932	32,401	1,620	34,021
1992-96	23,091	0	2,528	2,528	25,619	2,954	28,573

[a] Data are preliminary.

Attachment Table 8. Alaskan catch of Yukon River coho salmon, 1961-1997.

Year	Estimated Subsistence Use [a]	Harvest			
		Subsistence [b]	Commercial [c]	Sport [d]	Total
1961	9,192 [f,g]	9,192 [f,g]	2,855		12,047
1962	9,480 [f,g]	9,480 [f,g]	22,926		32,406
1963	27,699 [f,g]	27,699 [f,g]	5,572		33,271
1964	12,187 [f,g]	12,187 [f,g]	2,446		14,633
1965	11,789 [f,g]	11,789 [f,g]	350		12,139
1966	13,192 [f,g]	13,192 [f,g]	19,254		32,446
1967	17,164 [f,g]	17,164 [f,g]	11,047		28,211
1968	11,613 [f,g]	11,613 [f,g]	13,303		24,916
1969	7,776 [f,g]	7,776 [f,g]	15,093		22,869
1970	3,966 [f,g]	3,966 [f,g]	13,188		17,154
1971	16,912 [f,g]	16,912 [f,g]	12,203		29,115
1972	7,532 [f,g]	7,532 [f,g]	22,233		29,765
1973	10,236 [f,g]	10,236 [f,g]	36,641		46,877
1974	11,646 [f,g]	11,646 [f,g]	16,777		28,423
1975	20,708 [f,g]	20,708 [f,g]	2,546		23,254
1976	5,241 [f,g]	5,241 [f,g]	5,184		10,425
1977	16,333 [g]	16,333 [g]	38,863	112	55,308
1978	7,787 [g]	7,787 [g]	26,152	302	34,241
1979	9,794	9,794	17,165	50	27,009
1980	20,158	20,158	8,745	67	28,970
1981	21,228	21,228	23,680	45	44,953
1982	35,894	35,894	37,176	97	73,167
1983	23,905	23,905	13,320	199	37,424
1984	49,020	49,020	81,940	831	131,791
1985	32,264	32,264	57,672	808	90,744
1986	34,468	34,468	47,255	1,535	83,258
1987	84,894	84,894 [h]	0	1,292	86,186
1988	69,080	69,080	99,907	2,420	171,407
1989	41,583	41,583	85,493	1,811	128,887
1990	47,896	44,641	46,937	1,947	93,525
1991	40,894	37,388	109,657	2,775	149,820
1992	53,344	51,921	9,608 [k]	1,666	63,195
1993	15,772	15,772	0	897	16,669
1994	48,926	44,594	4,452	2,174	51,220
1995	29,716	28,642	47,206	1,278	77,126
1996	33,651	30,510	57,352	1,588	89,450
1997 [j]	[m]	[m]	35,320	[m]	35,320
Average					
1961-86	17,199	17,199	21,292	405	38,647
1987-91	56,869	55,517	68,399	2,049	125,965
1992-96	36,282	34,288	23,724	1,521	59,532

[a] Includes salmon harvested for subsistence purposes, and an estimate of the number of salmon carcasses harvested for the commercial production of salmon roe and used for subsistence. These data are only available since 1990.

[b] Includes salmon harvested for subsistence and personal use.

[c] Includes ADF&G test fish sales, fish sold in the round, and estimated numbers of female salmon commercially harvested for the production of salmon roe (see Bergstrom et al. 1992: 1990 Yukon Area AMR).

[d] Sport fish harvest for the Alaskan portion of the Yukon River drainage. The majority of this harvest is believed to have been taken within the Tanana River drainage (see Schultz et al. 1993: 1992 Yukon Area AMR).

[f] Catches estimated because catches of species other than chinook were not differentiated.

[g] Minimum estimates because surveys were conducted prior to the end of the fishing season.

[h] Includes an estimated 5,015 and 31,276 coho salmon illegally sold in Districts 5 and 6 (Tanana River), respectively.

[j] Data are preliminary.

[k] Commercial fishery operated only in District 6, the Tanana River.

[m] Data are unavailable at this time.

Attachment Table 9. Chinook salmon escapement counts for selected spawning areas in the Alaskan portion of the Yukon River drainage, 1961-1997. [a]

	Andreafsky River			Anvik River		Nulato River			Gisasa River		Chena River			Salcha River		
	East Fork		West Fork	River	Index Area	North Fork	South Fork	Mainstem			River		Index Area	River		Index Area
Year	Aerial	Tower or Weir	Aerial	Aerial [b]	Aerial [b]	Aerial [c]	Aerial	Tower	Aerial	Weir	Population Estimate [m]	Aerial	Aerial [d]	Population Estimate [m]	Aerial	Aerial [f]
1961	1,003			1,226		376 [g]	167		266 [g]						2,878	
1962	675 [g]		762 [g]									61 [g,h]			937	
1963												137 [g]				
1964	867		705												450	
1965			344 [g]	650 [g]											408	
1966	361		303	638											800	
1967			276 [g]	336 [g]												
1968	380		383	310 [g]											739	
1969	274 [g]		231 [g]	296 [g]											461 [g]	
1970	665		574 [g]	368								6 [g]			1,882	
1971	1,904		1,682									193 [g,h]			158 [g]	
1972	798		582 [g]	1,198								138 [g,h]			1,193	1,034
1973	825		788	613								21 [g]			391	352 [i]
1974			285	471 [g]		55 [g]	23 [g]		161			1,016 [h]	959 [h]		1,857	1,620
1975	993		301	730		123	81		385			316 [h]	262 [h]		1,055	950 [i]
1976	818		643	1,053		471	177		332			531	496		1,641	1,473
1977	2,008		1,499	1,371		286	201		255			563			1,202	1,052
1978	2,487		1,062	1,324		498	422		45 [g]			1,726			3,499	3,258
1979	1,180		1,134	1,484		1,093	414		484			1,159 [g]			4,789	4,310 [i]
1980	958 [g]		1,500	1,330	1,192	954 [g]	369 [g]		951			2,541			6,757	6,126
1981	2,146 [g]		231 [g]	807 [g]	577 [g]		791					600 [g]			1,237	1,121
1982	1,274		851						421			2,073			2,534	2,346
1983				653 [g]	376 [g]	526	480		572			2,553	2,336		1,961	1,803
1984	1,573 [g]		1,993	641 [g]	574 [g]							501	494		1,031	906
1985	1,617		2,248	1,051	720	1,600	1,180		735			2,553	2,262		2,035	1,860
1986	1,954	1,530 [k]	3,158	1,118	918	1,452	1,522		1,346		9,065	2,031	1,935		3,368	3,031 [i]
1987	1,608	2,011 [k]	3,281	1,174	879	1,145	493		731		6,404	1,312	1,209	4,771	1,898	1,671
1988	1,020	1,339 [k]	1,448	1,805	1,449	1,061	714		797		3,346	1,966	1,760	4,562	2,761	2,553
1989	1,399		1,089	442 [g]	212 [g]						2,666	1,280	1,185	3,294	2,333	2,136
1990	2,503		1,545	2,347	1,595	568 [g]	430 [g,n]		884 [g]		5,603	1,436	1,402	10,728	3,744	3,429
1991	1,938		2,544	875 [g]	625 [g]	767	1,253		1,690		3,025	1,277 [g]	1,277 [g]	5,608	2,212 [g]	1,925 [g]
1992	1,030 [g]		2,002 [g]	1,536	931	348	231		910		5,230	825 [g]	799 [g]	7,862	1,484 [g]	1,436 [g]
1993	5,855		2,765	1,720	1,526	1,844	1,181		1,573		12,241 [k]	2,943	2,660	10,007 [k]	3,636	3,562
1994	300 [g]	7,801 [p,r]	213 [g]		913 [g]	843	952	1,795 [r]	2,775	2,888 [r]	11,877 [k]	1,570	1,570	18,399 [k]	11,823	11,189
1995	1,635	5,841 [p]	1,108	1,996	1,147	968	681	1,412	410	4,023	9,680	3,575	3,039	13,643 [k]	3,978	3,734
1996		2,955 [p]	624	839	709		100 [n]	756		1,952	6,833	2,233	2,112	7,958	4,866	4,800
1997 [s]	1,140	3,186 [p]	1,510	3,979	2,690			4,766	144 [g]	3,764	13,390 [k]	3,495	3,303	18,396 [k]	3,457 [g]	3,457 [g]
E.O. [t]	>1,500		>1,400	>1,300 [u]	>500 [u]	>800	>500		>600				>1,700			>2,500

continued

[a] Aerial survey counts are peak counts only. Survey rating was fair or good unless otherwise noted.
[b] From 1961-1970, river count data are from aerial surveys of various segments of the mainstem Anvik River. From 1972-1979, counting tower operated; mainstem aerial survey counts below the tower were added to tower counts. From 1980-present, aerial survey counts for the river are best available minimal estimates for the entire Anvik River drainage. Index area counts are from the mainstem Anvik River between the Yellow River and McDonald Creek.
[c] Includes mainstem counts below the confluence of the North and South Forks, unless otherwise noted.
[d] Chena River index area for assessing the escapement objective is from Moose Creek Dam to Middle Fork River.
[f] Salcha River index area for assessing the escapement objective is from the TAPS crossing to Caribou Creek.
[g] Incomplete and/or poor survey conditions resulting in minimal or inaccurate counts.
[h] Boat survey.
[i] Data unavailable for index area. Calculated from historic (1972-91) average ration of index area counts to total river counts (0.90:1.0).
[k] Tower counts.
[m] Mark-recapture population estimate.
[n] Mainstem counts below the confluence of the North and South Forks Nulato River included in the South Fork counts.
[p] Weir counts.
[r] Incomplete count because of late installation and/or early removal of project.
[s] Data are preliminary.
[t] Interim escapement goals. Established March, 1992.
[u] Interim escapement goal for the entire Anvik River drainage is 1,300 salmon. Interim escapement objective for mainstem Anvik River between the Yellow River and McDonald Creek is 500 salmon.

Attachment Table 10. Chinook salmon escapement counts for selected spawning areas in the Canadian portion of the Yukon River drainage, 1991-1997.

Year	Tincup Creek [a]	Tatchun Creek [b]	Little Salmon River [a]	Big Salmon River [a,c]	Nisutlin River [a,d]	Ross River [a,f]	Wolf River [a,g]	Whitehorse Fishway Count	Whitehorse Fishway Percent Hatchery Contribution	Canadian Mainstem Border Passage Estimate	Canadian Mainstem Harvest	Canadian Mainstem Spawning Escapement Estimate [i]
1961								1,068	0			
1962								1,500	0			
1963								483	0			
1964								595	0			
1965								903	0			
1966		7 [k]						563	0			
1967								533	0			
1968			173 [k]	857 [k]	407 [k]	104 [k]		414	0			
1969			120	286	105			334	0			
1970		100		670	615		71 [k]	625	0			
1971		130	275	275	650		750	856	0			
1972		80	126	415	237		13	391	0			
1973		99	27 [k]	75 [k]	36 [k]			224	0			
1974		192		70 [k]	48 [k]			273	0			
1975		175		153 [k]	249		40 [k]	313	0			
1976		52		86 [k]	102			121	0			
1977		150	408	316 [k]	77			277	0			
1978		200	330	524	375			725	0			
1979		150	489 [k]	632	713		183 [k]	1,184	0			
1980		222	286 [k]	1,436	975		377	1,383	0			
1981		133	670	2,411	1,626	949	395	1,555	0			
1982		73	403	758	578	155	104	473	0	36,598	16,808	19,790
1983	100	264	101 [k]	540	701	43 [k,n]	95	905	0	47,741	18,752	28,989
1984	150	153	434	1,044	832	151 [k]	124	1,042	0	43,911	16,295	27,616
1985	210	190	255	801	409	23 [k]	110	508	0	29,881	19,151	10,730
1986	228	155	54 [k]	745	459 [k]	72 [n]	109	557	0	36,479	20,064	16,415
1987	100	159	468	891	183	180 [k]	35	327	0	30,823	17,563	13,260
1988	204	152	368	765	267	242	66	405	16	44,445	21,327	23,118
1989	88	100	862	1,662	695	433 [p]	146	549	19	42,620	17,419	25,201
1990	83	643	665	1,806	652	457 [k]	188	1,407	24	56,679	18,980	37,699
1991			326	1,040		250	201 [r]	1,266 [h]	51 [h]	41,187	20,444	20,743
1992	73	106	494	617	241	423	110 [r]	758 [h]	84 [h]	43,185	17,803	25,382
1993		183	184	572	339	400	168 [r]	668 [h]	73 [h]	45,027	16,469	28,558
1994	101 [k]	477	726	1,764	389	506	393 [r]	1,577 [h]	54 [h]	46,680	20,790	25,890
1995	121	397	781	1,314	274	253 [k]	229 [r]	2,103	57	52,353	20,091	32,262
1996	150	423	1,150	2,565	719	102 [k]	705 [r]	2,958	35 [o]	47,955	19,546	28,409
1997 [p]	193	266 [k]	1,025	1,345	277		322 [r]	2,084	24	53,400	15,604	37,796
E.O.												33,000-43,000 [q]

continued

[a] Data obtained by aerial survey unless otherwise noted. Only peak counts are listed. Survey rating is fair to good, unless otherwise noted.
[b] All foot surveys except 1978 (boat survey) and 1986 (aerial survey).
[c] For 1968, 1970, and 1971 counts are from mainstem Big Salmon River. For all other years counts are from the mainstem Big Salmon River between Big Salmon Lake and the vicinity of Souch Creek.
[d] One Hundred Mile Creek to Sidney Creek.
[f] Big Timber Creek to Lewis Lake.
[g] Wolf Lake to Red River.
[h] Counts and estimated percentages may be slightly exaggerated. In some or all of these years a number of adipose-clipped fish ascended the fishway, and were counted, more than once. These fish would have been released into the fishway as fry between 1989 and 1994, inclusive.
[j] Estimated total spawning escapement excluding Porcupine River (estimated border escapement minus the Canandian catch).
[k] Incomplete and/or poor survey conditions resulting in minimal or inaccurate counts.
[m] Estimate derived by dividing the annual 5-area (Whitehorse Fishway, Big Salmon, Nisutlin, Wolf, Tatchun) count by the average proportion of the annual 5-area index count to the estimated spawning escapement from the DFO tagging study for years 1983, and 1985-1989.
[n] Information on area surveyed is unavailable.
[p] Counts are for Big Timber Creek to Sheldon Lake.
[q] Interim escapement objective. Stabilization escapement objective for years 1990-1995 is 18,000 salmon. Rebuilding step escapement objective for years 1996-2001 is 28,000 salmon.
[r] Counts are for Wolf Lake to Fish Lake outlet.
[s] Data are preliminary.

Attachment Table 11. Summer chum salmon escapement counts for selected spawning areas in the Alaskan portion of the Yukon River drainage, 1973-1997. [a]

	Andreafsky River			Anvik River		Rodo River	Kaltag Creek	Nulato River			Gisasa River		Hogatza River		Tozitna River	Chena River		Salcha River	
	East Fork		West Fork					South Fork	North Fork [c]	Mainstem			Clear & Caribou Cr.	Clear Creek					
Year	Aerial	Sonar, Tower, or Weir Counts	Aerial	Tower & Aerial [b]	Sonar	Aerial	Tower	Aerial	Aerial	Tower	Aerial	Weir	Aerial	Tower	Aerial	Aerial	Tower	Aerial	Tower
1973	10,149 [d]		51,835	249,015												79 [d]		290	
1974	3,215 [d]		33,578	411,133		16,137		29,016	29,334		22,022				1,823	4,349		3,510	
1975	223,485		235,954	900,967		25,335		51,215	87,280		56,904		22,355		3,512	1,670		7,573	
1976	105,347		118,420	511,475		38,258		9,230 [d]	30,771		21,342		20,744		725 [d]	685		6,484	
1977	112,722		63,120	358,771		16,118		11,385	58,275		2,204 [d]		10,734		761 [d]	610		677 [d]	
1978	127,050		57,321	307,270		17,845		12,821	41,659		9,280 [d]		5,102		2,262	1,609		5,405	
1979	66,471		43,391		280,537			1,506	35,598		10,962		14,221			1,025 [d]		3,060	
1980	36,823 [d]		114,759		492,676			3,702 [d]	11,244 [d]		10,388		19,786		580	338		4,140	
1981	81,555	147,312 [f]			1,486,182			14,348								3,500		8,500	
1982	7,501 [d]	181,352 [f]	7,267 [d]		444,581						334 [d]		4,984 [d]		874	1,509		3,756	
1983		110,608 [f]			362,912			1,263 [d]	19,749		2,356 [d]		28,141		1,604	1,097		716 [d]	
1984	95,200 [d]	70,125 [f]	238,565		891,028								184 [d]			1,861		9,810	
1985	66,146		52,750		1,080,243	24,576		10,494	19,344		13,232		22,566		1,030	1,005		3,178	
1986	83,931	167,614 [g]	99,373		1,189,602			16,848	47,417		12,114				1,778	1,509		8,028	
1987	6,687 [d]	45,221 [g]	35,535		455,876			4,094	7,163		2,123		5,669 [d]			333		3,657	
1988	43,056	68,937 [g]	45,432		1,125,449	13,872		15,132	26,951		9,284		6,890		2,983	432		2,889 [d]	
1989	21,460 [d]				636,906											714 [d]		1,574 [d]	
1990	11,519 [d]		20,426 [d]		403,627	1,941 [d]		3,196 [d,h]	1,419 [d]		450 [d]		2,177 [d]		36	245 [d]		450 [d]	
1991	31,886		46,657		847,772	3,977		13,150	12,491		7,003		9,947		93	115 [d]		154 [d]	
1992	11,308 [d]		37,808 [d]		775,626	4,465		5,322	12,358		9,300		2,986		794	848 [d]		3,222	
1993	10,935 [d]		9,111 [d]		517,409	7,867		5,486	7,698		1,581				970	168	5,400	212	5,809
1994		200,981 [i,k]			1,124,689		47,295			148,762 [k]	6,827	51,116 [k]	8,247 [m]			1,137	9,984	4,916	39,450
1995		172,148 [j]			1,339,418	12,849	77,193	10,875	29,949	236,890	6,458	136,886		116,735	4,985	185 [d]	3,519 [k]	934 [d]	30,784
1996		108,450 [j]			933,240	4,380	51,269	8,490 [d,h]		129,694		157,589	27,090 [m]	100,912	2,310	2,061	12,810 [k]	9,722	74,827 [k]
1997 [q]		51,189 [j]			609,118	2,775 [d]	48,018			157,975	686 [d]	31,802	1,821 [d]	76,454	428 [d]	796 [d]	9,439 [k]	3,968 [d]	35,741 [k]
E.O. [n]	>109,000		>116,000		>500,000				>53,000 [o]				>17,000 [p]					>3,500	

continued

[a] Aerial survey counts are peak counts only, survey rating is fair or good unless otherwise noted.
[b] From 1972-1979 counting tower operated; escapement estimate listed is the tower counts plus expanded aerial survey counts below the tower (see Buklis 1982).
[c] Includes mainstem counts below the confluence of the North and South Forks, unless otherwise noted.
[d] Incomplete survey and/or poor survey timing or conditions resulted in minimal or inaccurate count.
[f] Sonar count.
[g] Tower count.
[h] Mainstem counts below the confluence of the North and South Fords of the Nulato River included in the South Fork counts.
[j] Weir count.
[k] Incomplete count due to late installation and/or early removal of project or high water events.
[m] BLM helicopter survey.
[n] Interim escapement objective.
[o] Interim escapement objective for North Fork Nulato River only.
[p] Consists of Clear and Caribou Creeks interim escapement objectives of 9,000 and 8,000, respectively.
[q] Data are preliminary.

Attachment Table 12. Fall chum salmon escapement counts for selected spawning areas in Alaskan and Canadian portions of the Yukon River drainage, 1971-1997.

	Alaska				Canada					Canadian Mainstem		
Year	Toklat River [b]	Delta River [c]	Chandalar River [d]	Sheenjek River [d]	Fishing Branch River [f,g]	Mainstem Yukon River Index [g,h]	Koidern River [g]	Kluane River [g,i]	Teslin River [g,k]	Border Passage Estimate	Harvest	Spawning Escapement Estimate
1971					312,800							
1972		5,384			35,125 [n]			198 [p,r]				
1973		10,469			15,989 [s]	383		2,500				
1974	41,798	5,915		89,966 [t]	32,525 [s]			400				
1975	92,265	3,734 [v]		173,371 [t]	353,282 [s]	7,671		362 [r]				
1976	52,891	6,312 [v]		26,354 [t]	36,584			20				
1977	34,887	16,876 [v]		45,544 [t]	88,400			3,555				
1978	37,001	11,136		32,449 [t]	40,800			0 [r]				
1979	158,336	8,355		91,372 [t]	119,898			4,640 [r]				
1980 [ah]	26,346	5,137		28,933 [t]	55,268			3,150		39,130	16,218	22,912
1981	15,623	23,508		74,560	57,386 [w]			25,806		66,347	19,281	47,066
1982	3,624	4,235		31,421	15,901	1,020 [x]		5,378		47,049	15,091	31,958
1983	21,869	7,705		49,392	27,200	7,560		8,578 [r]		118,365	27,490	90,875
1984	16,758	12,411		27,130	15,150	2,800 [y]	1,300	7,200	200	81,900	25,267	56,633 [z]
1985	22,750	17,276 [v]		152,768	56,016 [s]	10,760	1,195	7,538	356	99,775	37,765	62,010
1986	17,976	6,703 [v]	59,313	84,207 [aa]	31,723 [s]	825	14	16,686	213	101,826	13,886	87,940
1987	22,117	21,180	52,416	153,267 [aa]	48,956 [s]	6,115	50	12,000		125,121	44,345	80,776
1988	13,436	18,024	33,619	45,206 [aa]	23,597 [s]	1,550	0	6,950	140	69,280	32,494	36,786
1989	30,421	21,342 [v]	69,161	99,116 [aa]	43,834 [s]	5,320	40	3,050	210 [p]	55,861	20,111	35,750
1990	34,739	8,992 [v]	78,631	77,750 [aa]	35,000 [ab]	3,651	1	4,683	739	82,947	31,212	51,735
1991	13,347	32,905 [v]		86,496 [ac]	37,733 [s]	2,426	53	11,675	468	112,303	33,842	78,461
1992	14,070	8,893 [v]		78,808 [ac]	22,517 [s]	4,438	4	3,339	450	67,962	18,880	49,082
1993	27,838	19,857		42,922 [ac]	28,707 [s]	2,620	0	4,610	555	42,165	12,422	29,743
1994	76,057	23,777 [v]		153,000 [ac,ad]	65,247 [s]	1,429 [p]	20 [p]	10,734	209 [p]	133,712	35,354	98,358
1995	54,513 [ah]	20,587	280,999	235,000 [ac,ad]	51,971 [s,aj]	4,701	0	16,456	633	198,203	40,111	158,092
1996	18,264	19,758	203,683	247,965 [ac,ad]	77,278 [s]	4,977		14,431	315	143,758	21,329	122,429
1997 [ad]	14,511	8,000	200,173	80,423	26,959	2,189		3,350	207	94,725	9,090	85,635
E.O. [af]	>33,000	>11,000		>64,000	50,000-120,000							>80,000

continued

[a] Latest table revision November 3, 1997.

[b] Expanded total abundance estimates for upper Toklat River index area using stream life curve (SLC) developed with 1987-1993 data. Index area includes Geiger Creek, Sushana River, and mainstem floodplain sloughs from approximately 0.25 mile upstream of roadhouse to approximately 1.25 miles downstream of roadhouse.

[c] Estimates are a total spawner abundance, generally from using spawner abudance curves and streamlife data.

[d] Side-scan sonar estimate 1986-1990, split beam sonar estimate 1995-1996.

[f] Located within the Canadian portion of the Porcupine River drainage. Total escapement estimated using weir to aerial survey expansion factor of 2.72, unless otherwise indicated.

[g] Aerial survey count unless otherwise indicated.

[h] Tatchun Creek to Fort Selkirk.

[j] Duke River to end of spawning sloughs below Swede Johnston Creek.

[k] Boswell Creek area (5 km below to 5 km above confluence).

[m] Excludes Fishing Branch River escapement (estimated border passage minus Canadian removal).

[n] Weir installed on September 22. Estimate consists of a weir count of 17,190 after September 22, and a tagging passage estimate of 17,935 prior to weir installation.

[p] Incomplete and/or poor survey conditions resulting in minimal or inaccurate counts.

[r] Foot survey.

[s] Weir count.

[t] Total escapement estimate using sonar to aerial survey expansion factor of 2.22.

[v] Population estimate from replicate foot surveys and stream life data.

[w] Initial aerial survey count was doubled before applying the weir/aerial expansion factor of 2.72 since only half of the spawning area was surveyed.

[x] Boat survey.

[y] Total index area not surveyed. Survey included the mainstem Yukon River between Yukon Crossing to 30 km below Fort Selkirk.

[z] Escapement estimate based on mark-recapture program unavailable. Estimate based on assumed average exploitation rate.

[aa] Expanded estimates for period approximateing second week August through middle fourth week September, using Chandalar River run timing data.

[ab] Weir was not operated. Although only 7,541 chum salmon were counted on a single survey flown October 26, a population estimate of approximately 27,000 fish was made through date of survey, based upon historic average aerial-to-weir expansion of 28%. Actual population of spawners was reported by DFO as between 30,000-40,000 fish considering aerial survey timing.

[ac] Total abundance estimate are for the period approximating second week August through middle fourth week of September. Comparative escapement estimates prior to 1986 are considered more conservative; approximating the period of end of August through middle week of September.

[ad] Data are preliminary.

[af] Interim escapement objective.

[ag] Based on escapement estimates for years 1974-1990.

[ah] Minimal estimate because of late timing of ground surveys with respect to peak of spawning.

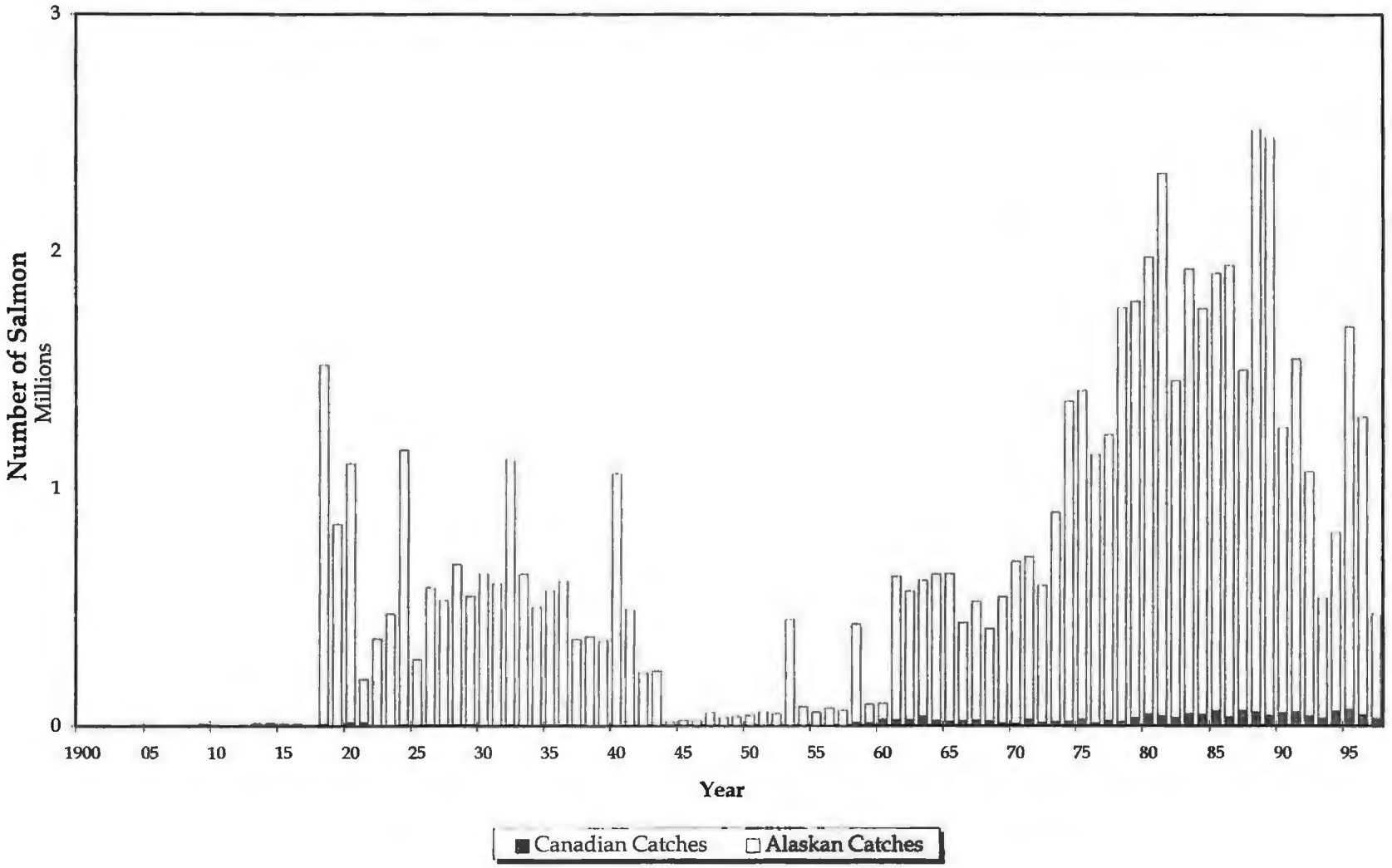
[aj] Incomplete count due to late installation and/or early removal of project or high water events.

Attachment Table 13. Coho salmon escapement counts for selected spawning areas in the Alaskan portion of the Yukon River drainage, 1972-1997. [a]

Year	Andreafsky River		Anvik River	Kantishna River		Nenana River			Seventeen Slough	Delta Clearwater River [f,g]	Clearwater Lake and Outlet	Richardson Clearwater River
	East Fork	West Fork		Geiger Creek [b]	Barton Creek	Lost Slough	Nenana Mainstem [c]	Wood Creek [d]				
1972										630	417	454 [k]
1973										3,322	551 [f]	375 [f]
1974						1,388			27	3,954 [l]	560	652 [f]
1975						943			956	5,100	1,575 [f, h]	4 [k]
1976			467 [k]	25 [j]		118			281	1,920	1,500 [f, h]	80 [k]
1977			81 [k]	60		524 [k]		310 [b]	1,167	4,793	730 [f, h]	327
1978						350		300 [b]	466	4,798	570 [f, h]	
1979						227			1,987	8,970	1,015 [f, h]	372
1980				3 [j]		499 [k]		1,603 [b]	592	3,946	1,545 [f, h]	611
1981	1,657 [k]					274		849 [n,r]	1,005	8,563 [p]	459 [k]	550
1982				81				1,436 [n,r]		8,365 [p]		
1983				42		766		1,042 [n]	103	8,019 [p]	253	88
1984				20 [j]		2,677		8,826 [n]		11,061	1,368	428
1985				42 [j]		1,584		4,470 [n]	2,081	5,358	750	
1986				5	496	794		1,664 [n]	218 [d,h]	10,857	3,577	146 [k]
1987				1,175		2,511		2,387 [n]	3,802	22,300	4,225 [f, h]	
1988	1,913	830	1,203	159	437	348		2,046 [n]		21,600	825 [f, h]	
1989				155	12 [k]			412 [n]	824 [k]	11,000	1,600 [f, h]	483
1990				211		688	1,308		15 [k]	8,325	2,375 [f, h]	
1991				427	467 [k]	564	447		52	23,900	3,150 [f, h]	
1992				77	55 [k]	372			490	3,963	229 [f, h]	500 [f]
1993				138	141	484	419	666 [n,s]	581	10,875	3,525 [f, h]	
1994				410	2,000 [n,s]	944	1,648	1,317 [n,s]	2,909	62,675 [w]	3,425 [f, h]	5,800 [f]
1995	10,901 [n]			142	192 [n,s]	4,169	2,218	500 [n]	2,972 [k]	20,100	3,625 [f, h]	
1996	8,037 [n]			233	0 [n]	2,040	2,171	2,416 [j]	3,668 [d,h]	14,075 [x]	1,125 [f, y]	
1997 [t]	9,462 [n]			274		1,524 [aa]	1,446	1,464 [j] [,ab]	1,996 [d,h]	11,525	2,775 [f, h]	
E.O.										>9,000 [u]		

continued

[a] Aerial surveys unless otherwise noted. Only peak counts presented. Survey rating is fair to good, unless otherwise noted.
[b] Foot survey.
[c] Mainstem Nenana River between confluences of Lost Slough and Teklanika River.
[d] Surveyed by F.R.E.D.
[f] Surveyed by Sport Fish division.
[g] Boat survey counts in the lower 17.5 river miles, unless otherwise indicated.
[h] Boat survey.
[k] Poor survey.
[n] Weir count.
[p] Expanded estimate based on partial survey counts and historic distribution of spawners from 1977-1980.
[r] Coho weir was operated at the mough of Clear Creek (Shores Landing).
[s] Incomplete count because of late installation and/or early removal of project.
[t] Data are preliminary.
[u] Interim escapement objective established March, 1993, based on boat survey counts of coho salmon in the lower 17.5 river miles during the period October 21-27.
[w] An additional 17,565 coho salmon were counted by helicopter in the Delta Clearwater outside of the normal mainstem index area.
[x] An additional 3,300 coho salmon were counted by helicopter in the Delta Clearwater outside of the normal mainstem index area.
[y] An additional 350 coho salmon were counted in Clearwater Lake Inlet.
[aa] Survey of western floodplain sloughs only.
[ab] Beginning at confluence of Clear Creek, the survey includes counts of Glacier and Wood Creeks up to their headwaters.



Attachment Figure 1. **Total utilization of chinook, chum and coho salmon, Yukon River, 1900-1997. The 1997 Alaskan harvest includes only commercial catch data. Other Alaskan harvest estimates are unavailable at this time.**

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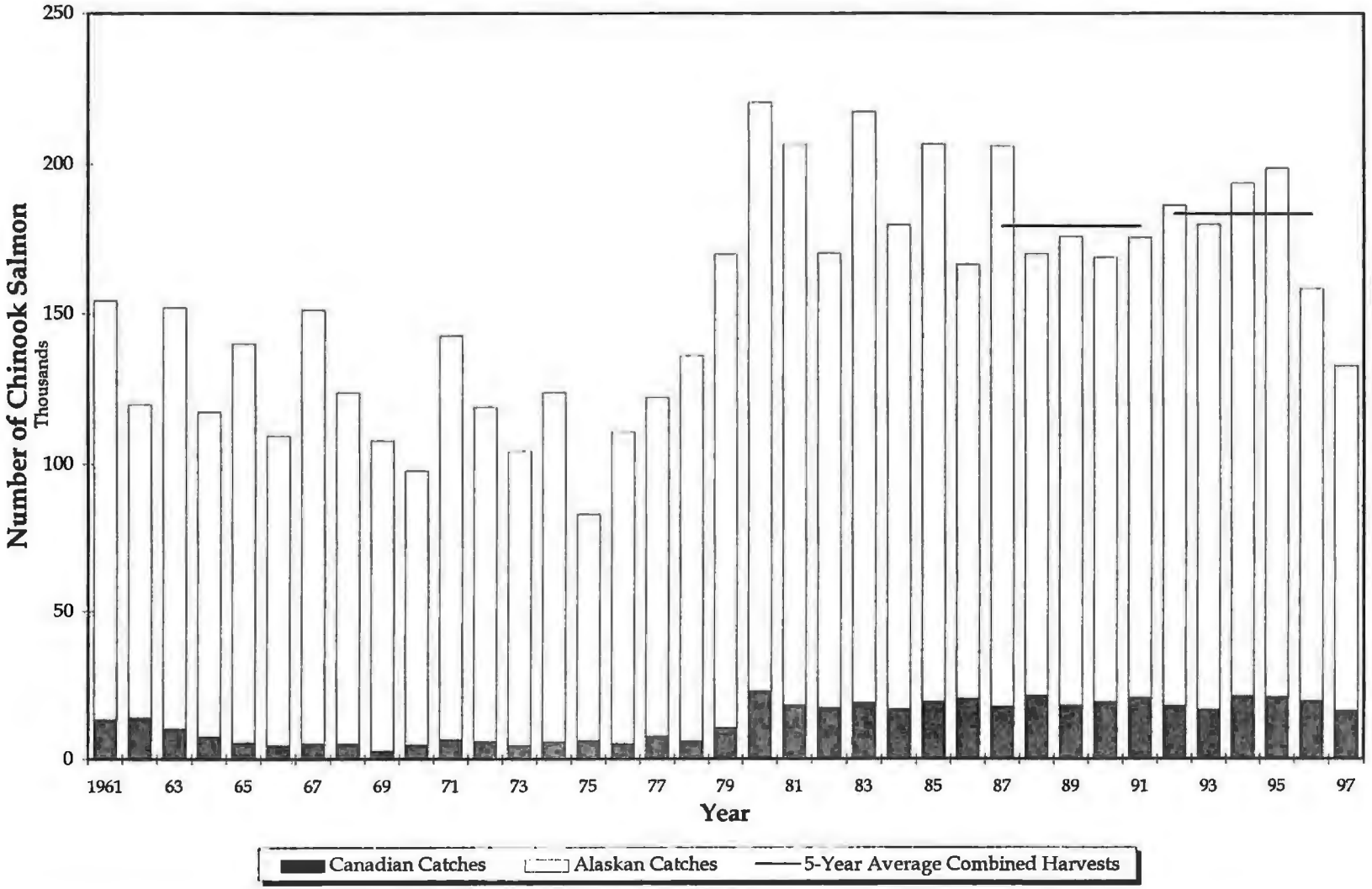
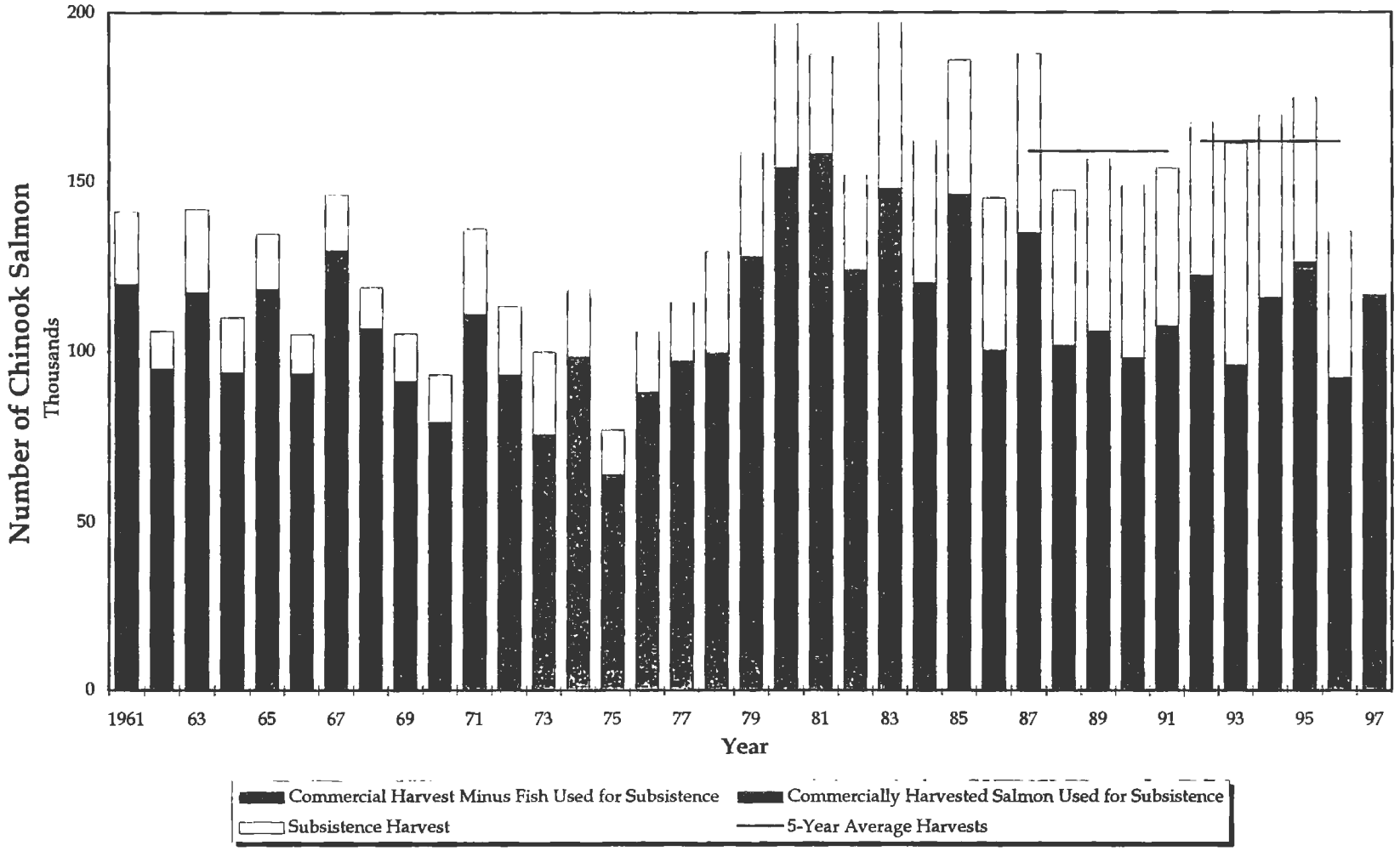
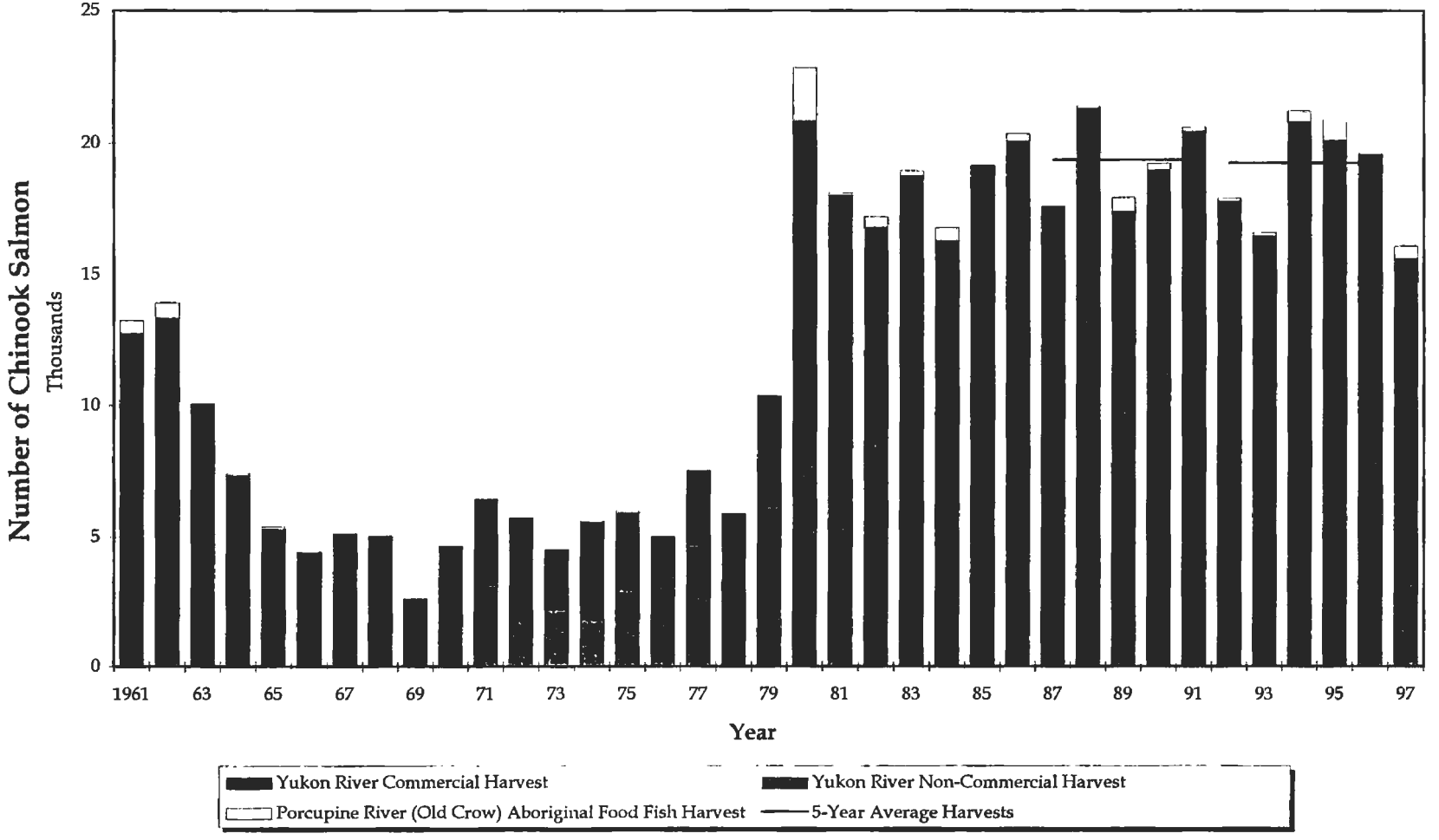


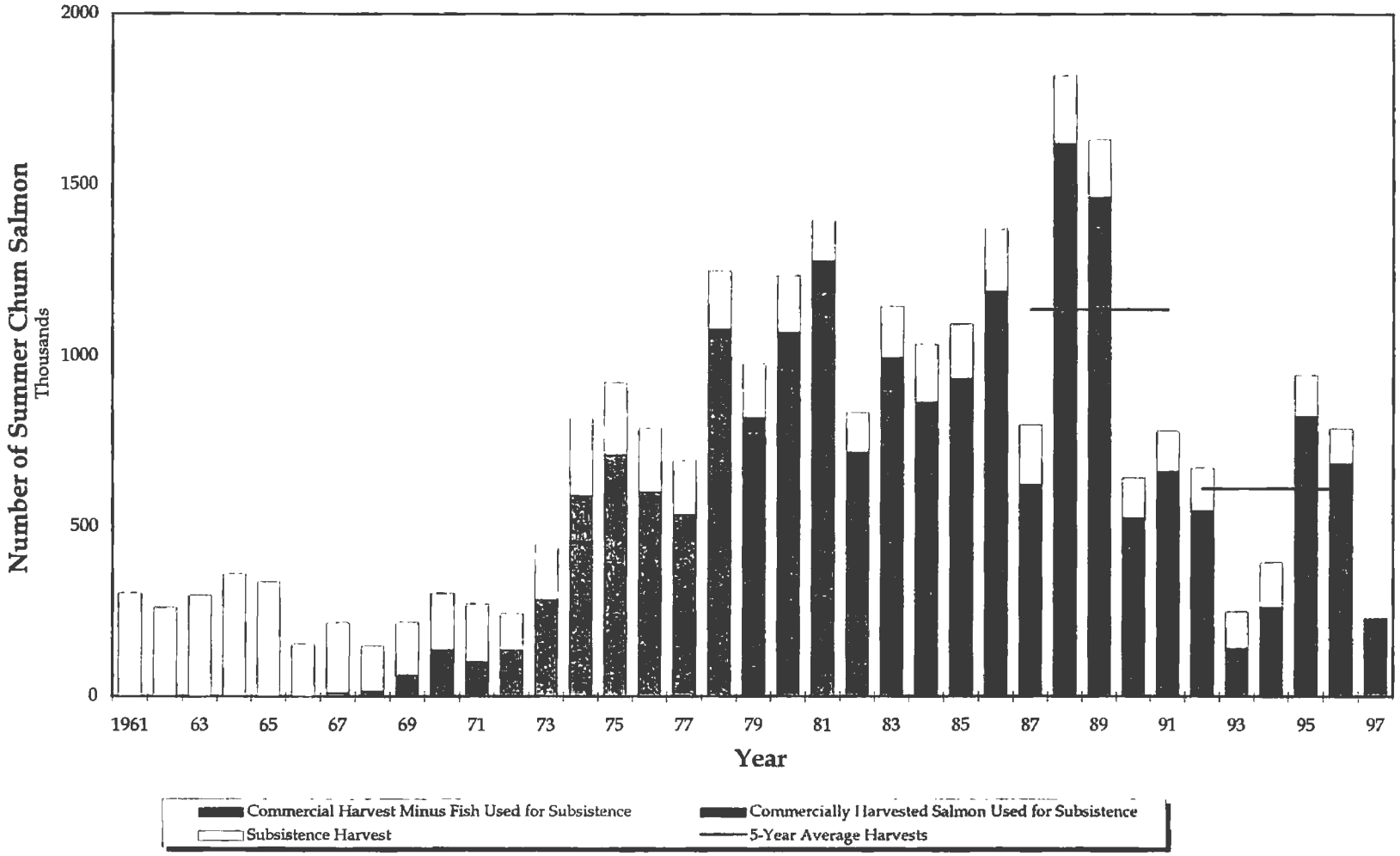
Attachment Figure 2. **Total utilization of chinook salmon, Yukon River, 1961-1997. The 1997 Alaskan harvest includes only commercial catch data. Other Alaskan harvest estimates are unavailable at this time.**



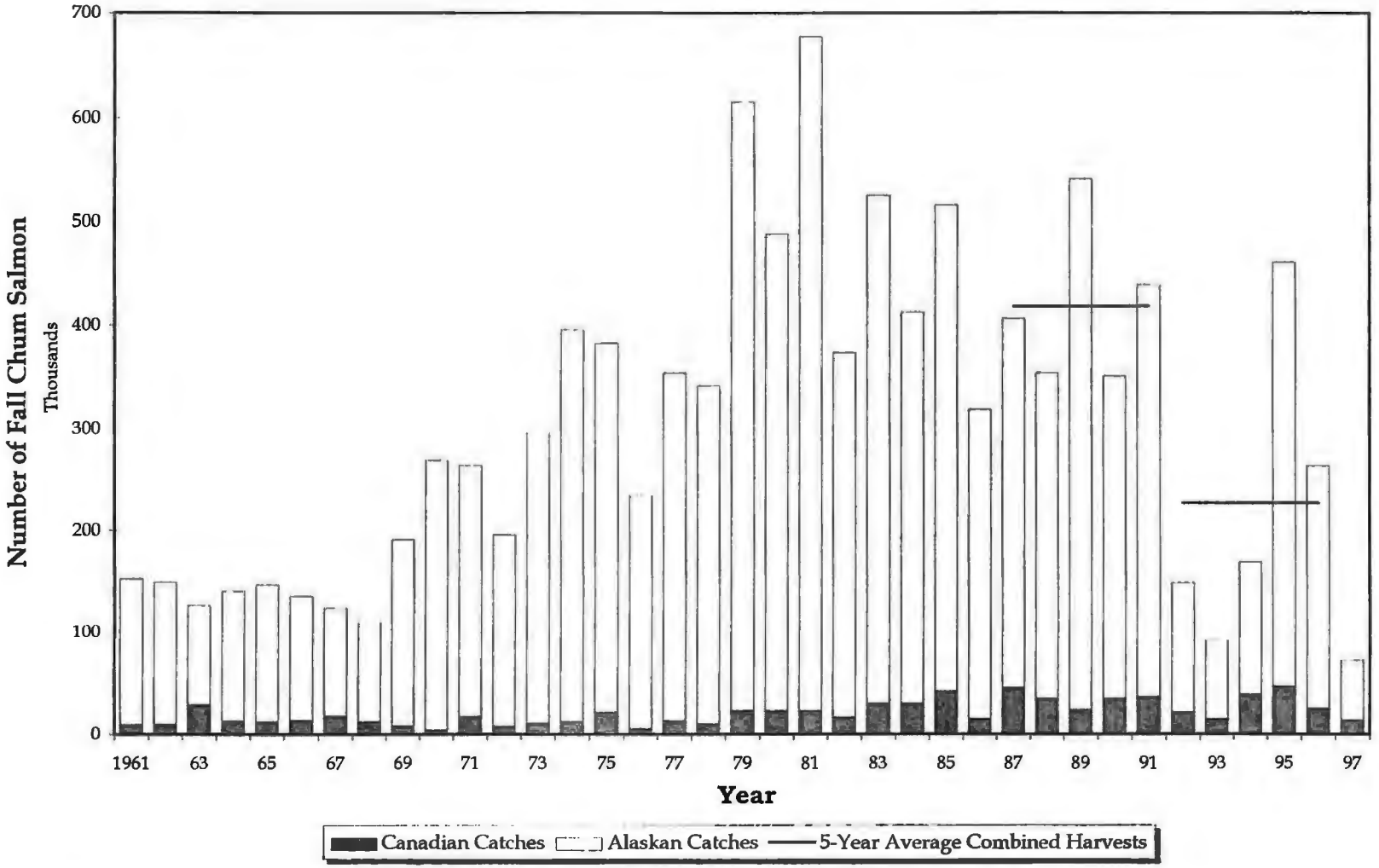
Attachment Figure 3. **Alaskan harvest of chinook salmon, Yukon River, 1961-1997. The 1997 harvest includes only commercial catch data. Other Alaskan harvest estimates are unavailable at this time.**



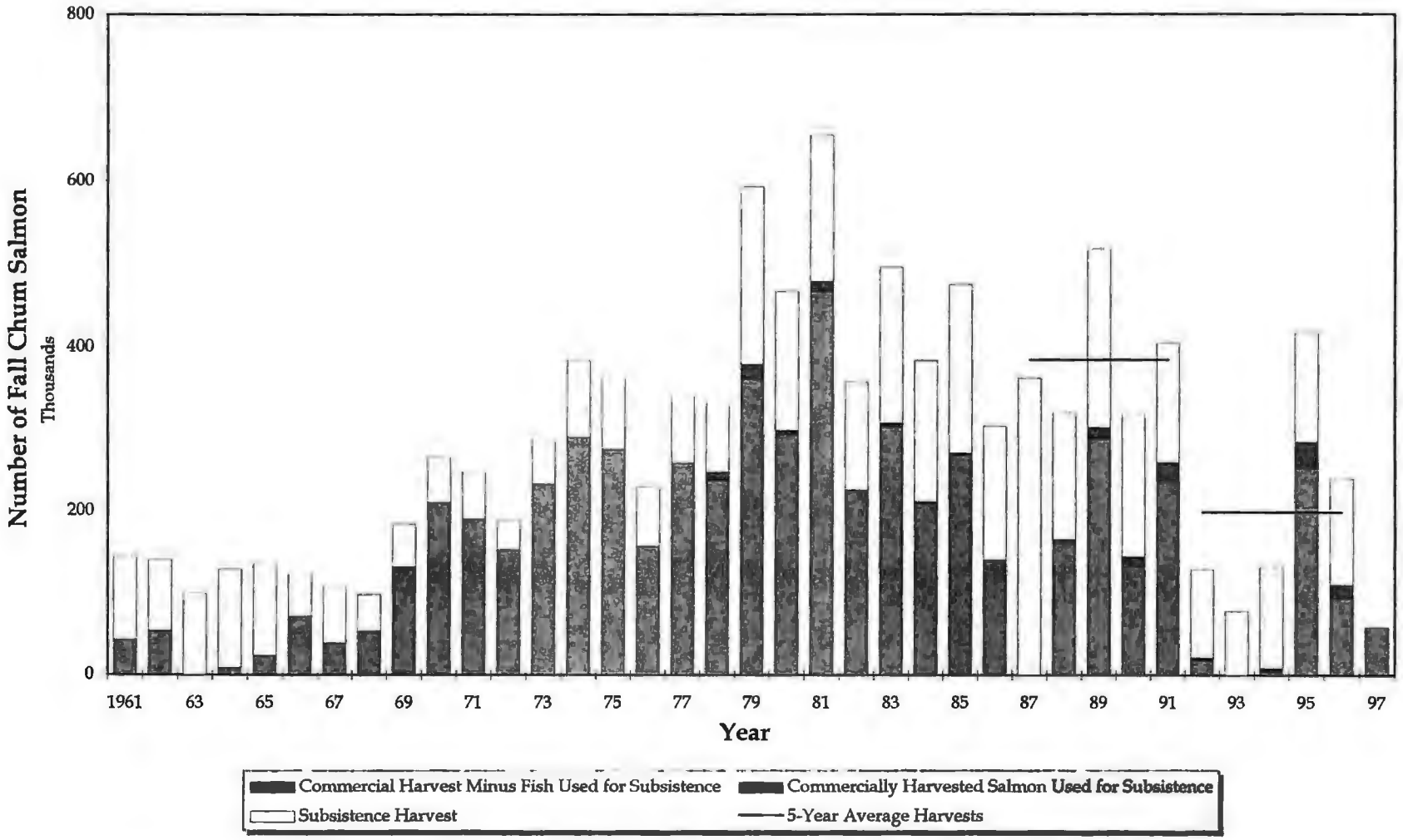
Attachment Figure 4. **Canadian harvest of chinook salmon, Yukon River, 1961-1997.**



Attachment Figure 5. **Alaskan harvest of summer chum salmon, Yukon River, 1961-1997. The 1997 harvest includes only commercial catch data. Other Alaskan harvest estimates are unavailable at this time.**



Attachment Figure 6. **Total utilization of fall chum salmon, Yukon River, 1961-1997. The 1997 Alaskan harvest includes only commercial catch data. Other Alaskan harvest estimates are unavailable at this time.**



Attachment Figure 7. **Alaskan harvest of fall chum salmon, Yukon River, 1961-1997. The 1997 harvest includes only commercial catch data. Other Alaskan harvest estimates are unavailable at this time.**

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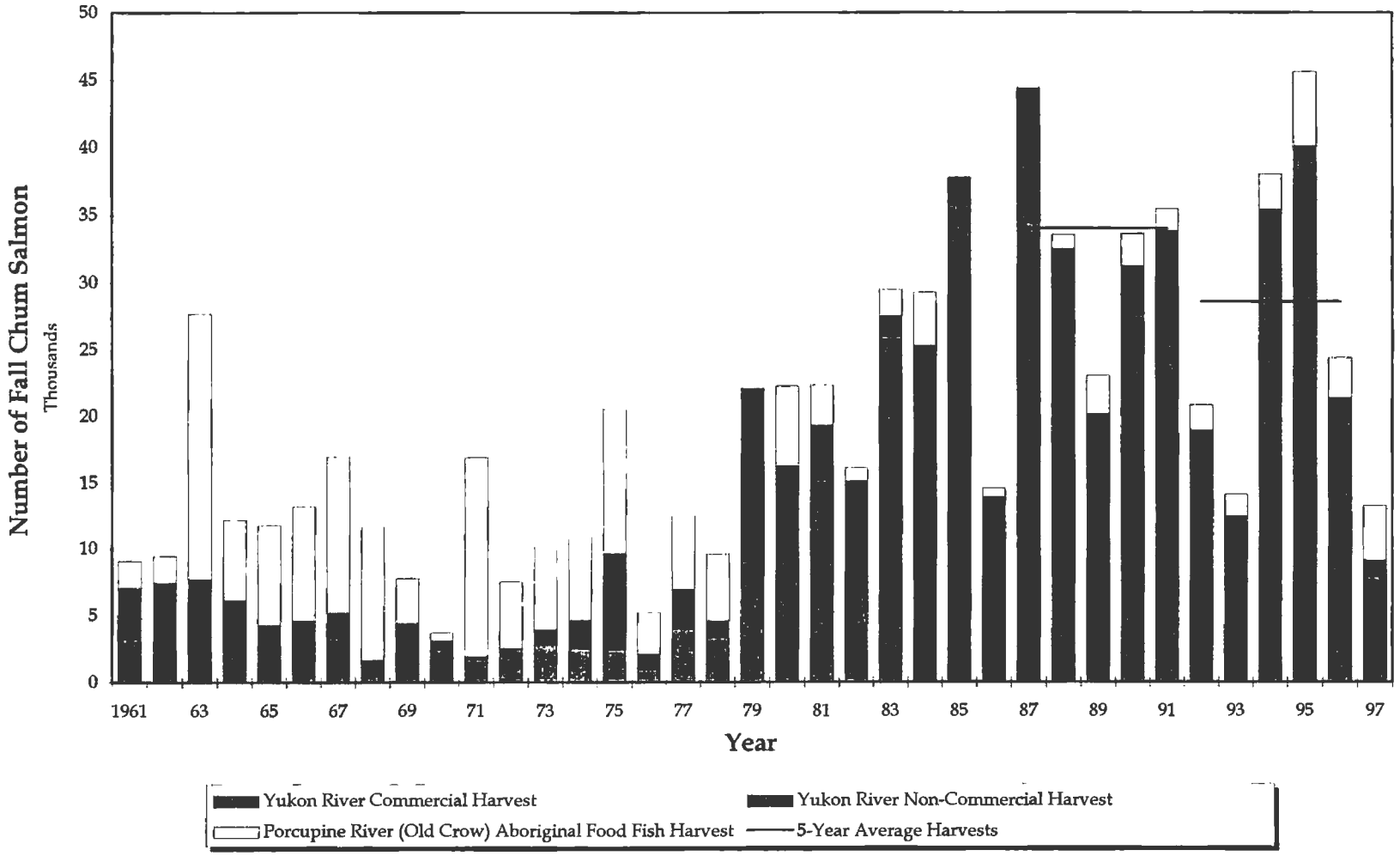
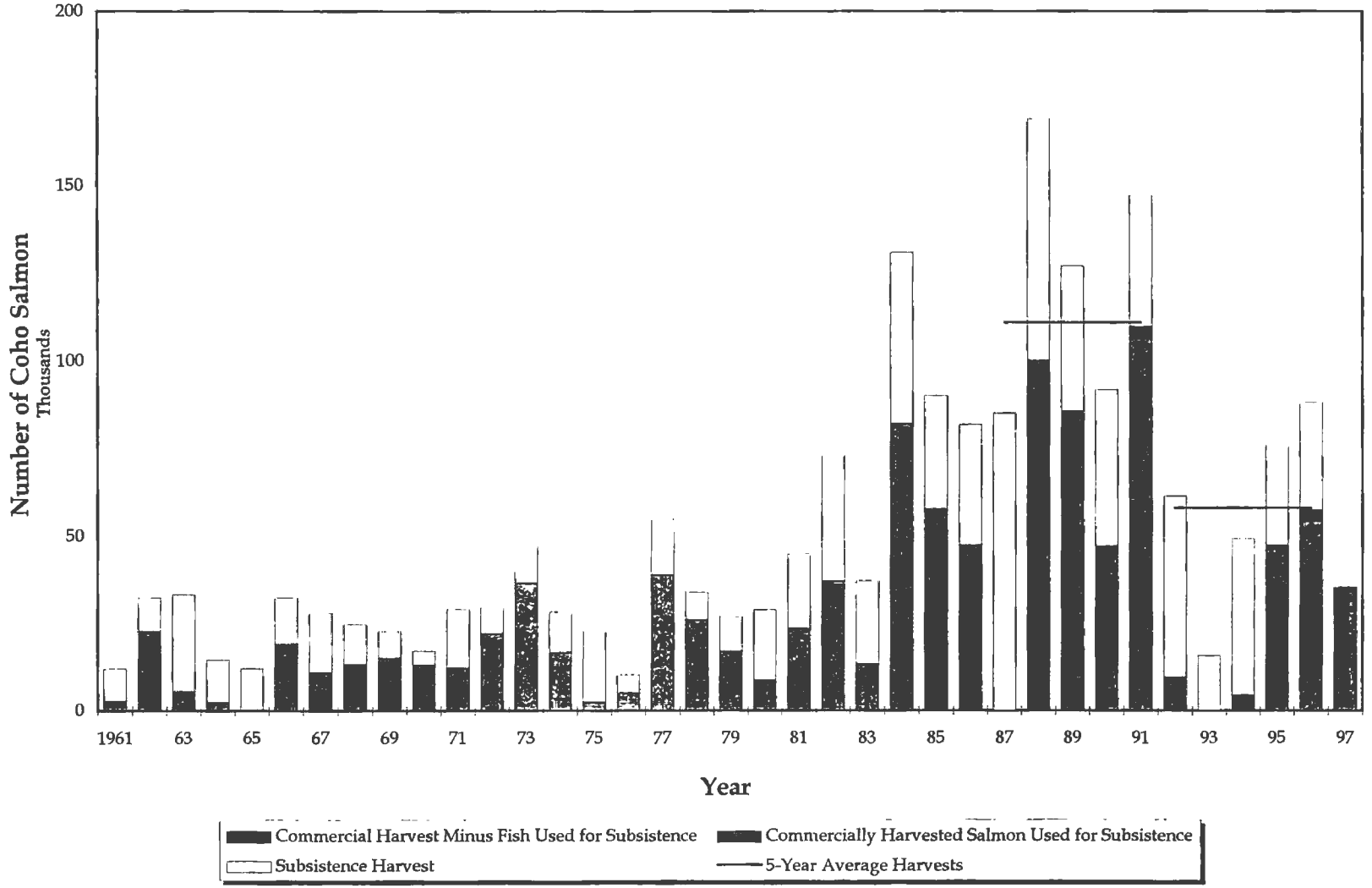
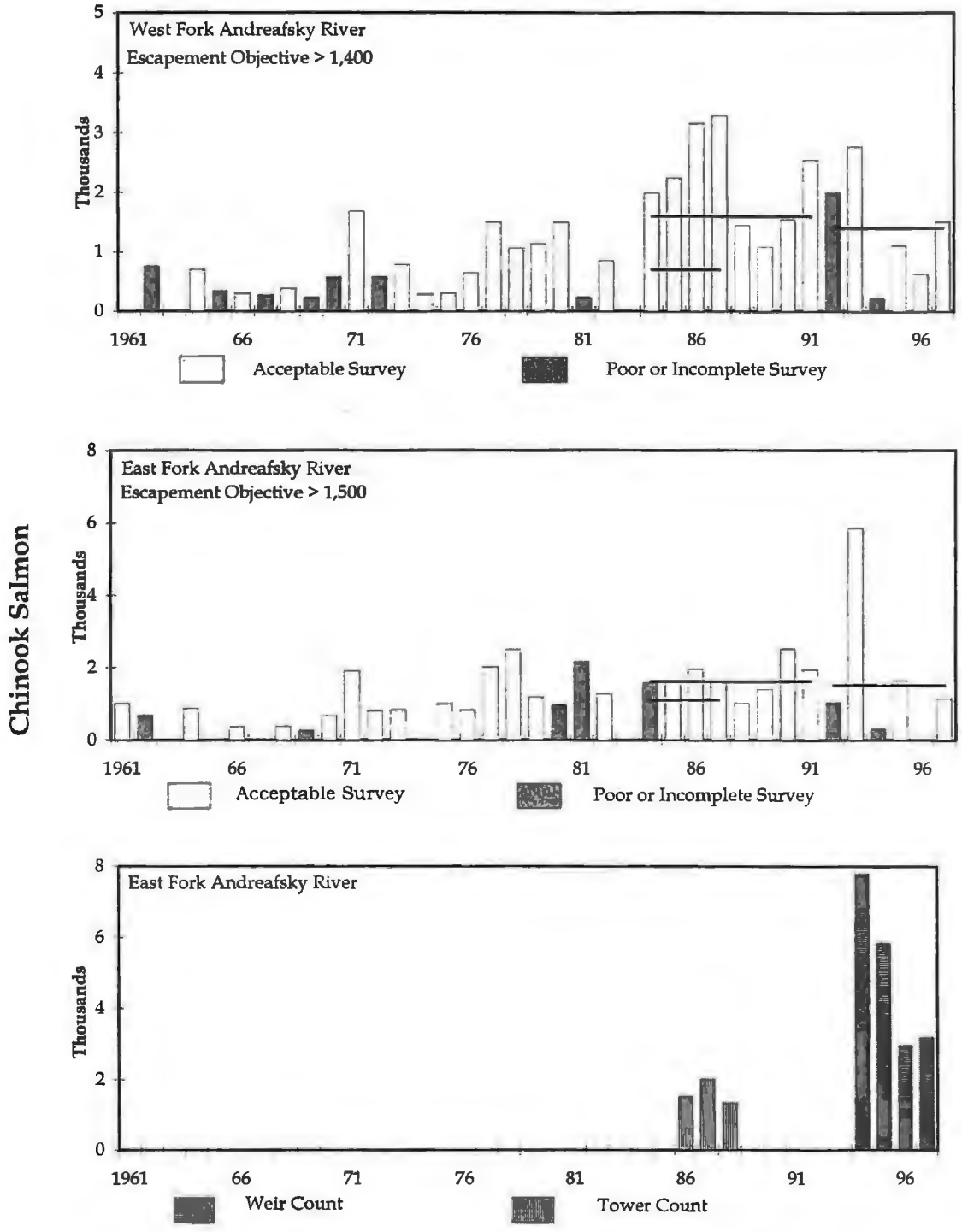


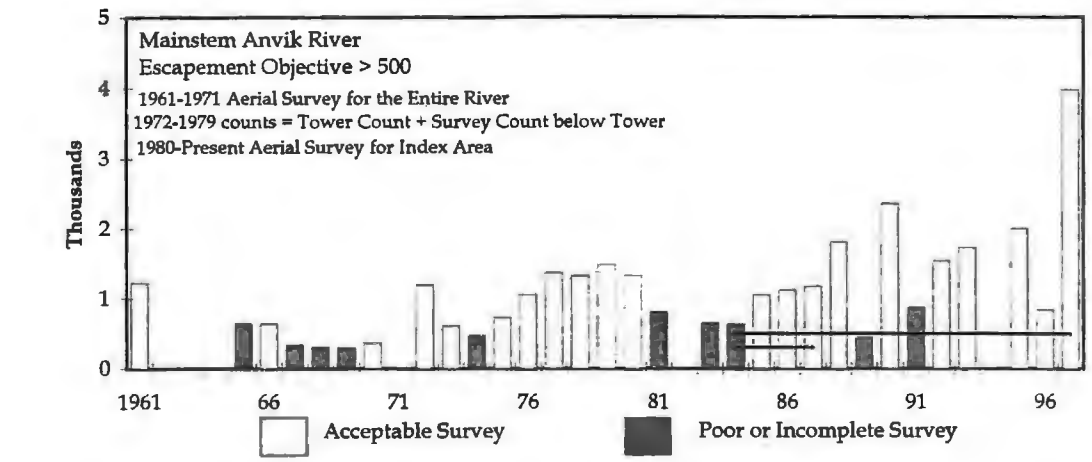
Attachment Figure 8. Canadian harvest of fall chum salmon, Yukon River, 1961-1997.

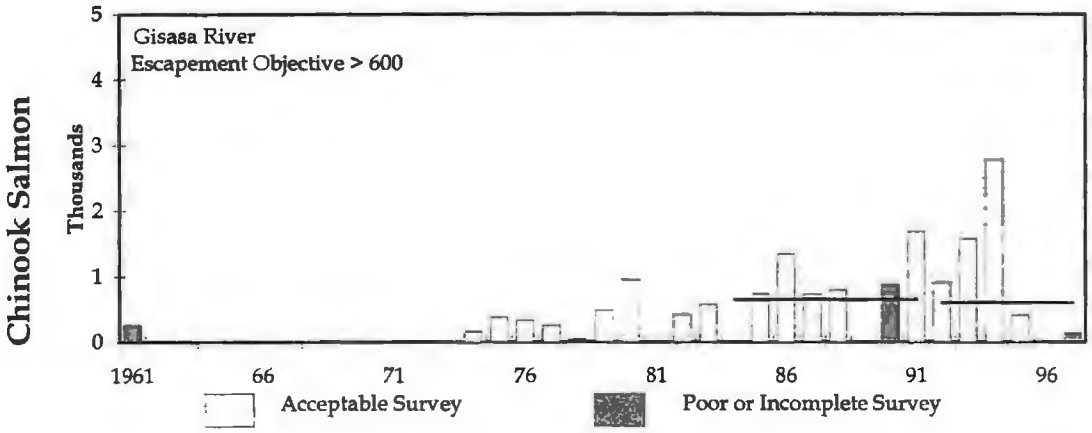


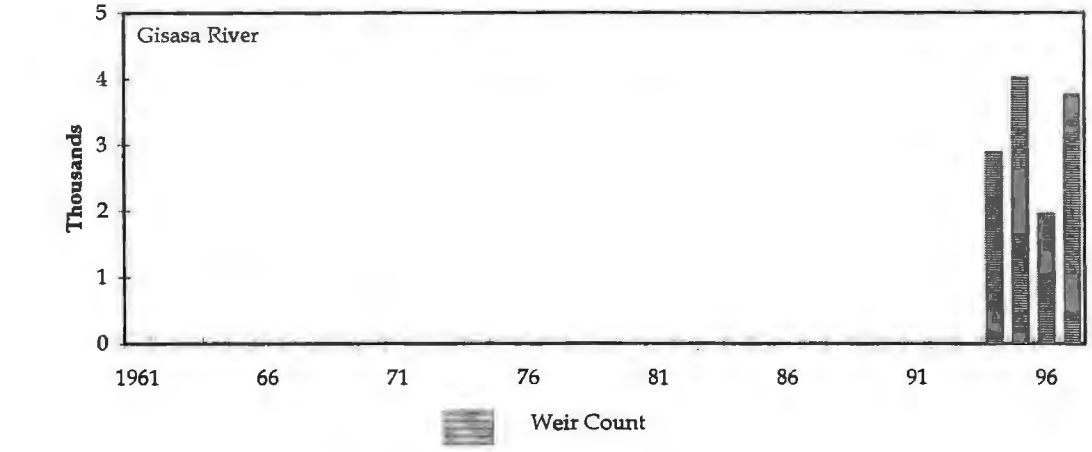
Attachment Figure 9. **Alaskan harvest of coho salmon, Yukon River, 1961-1997. The 1997 harvest includes only commercial catch data. Other Alaskan harvest estimates are unavailable at this time.**



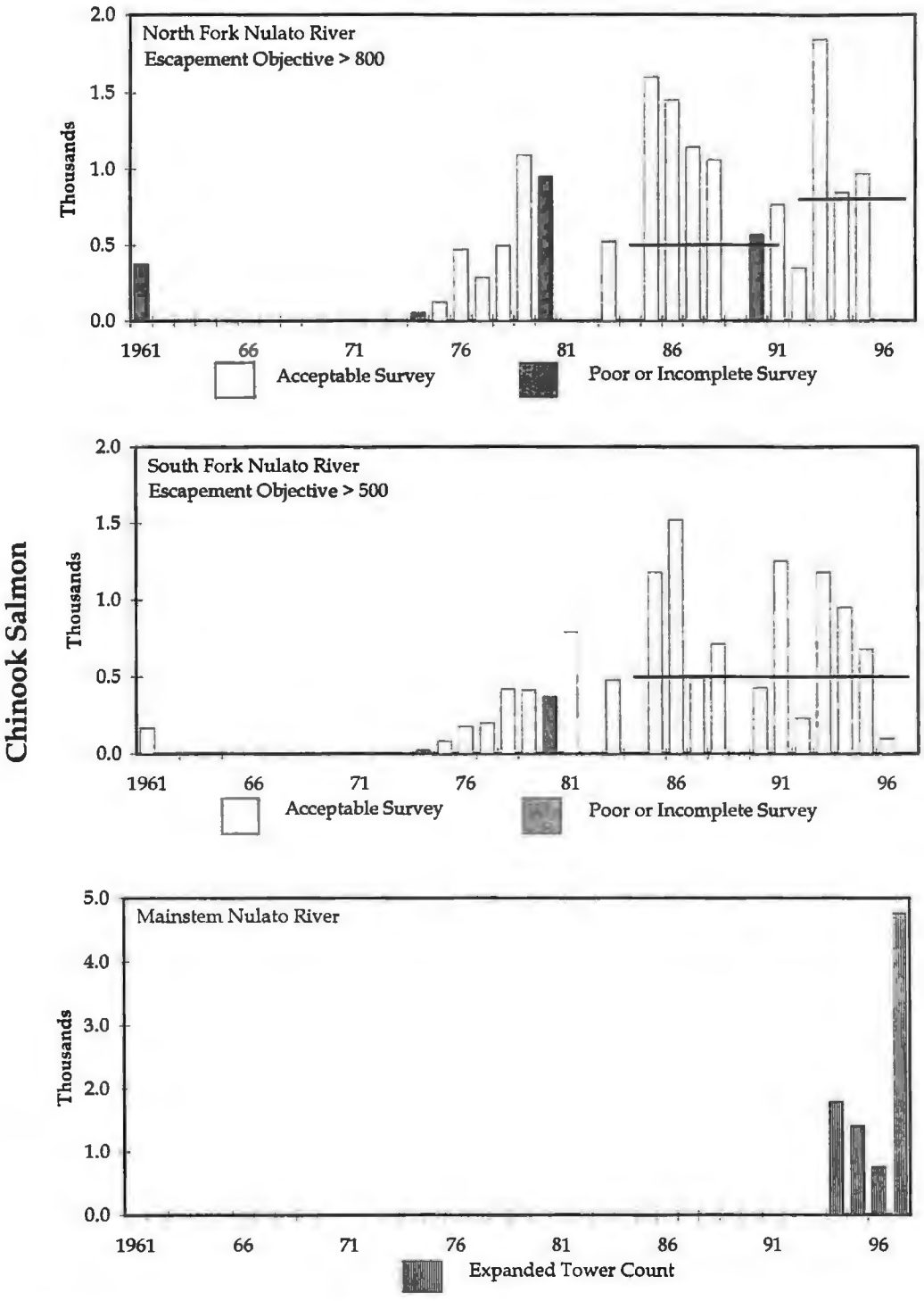
Attachment Figure 10. Chinook salmon escapement data for selected spawning areas in the Alaskan portion of the Yukon River drainage, 1961-1997. Data are aerial survey observations unless noted otherwise. Horizontal lines represent interim escapement goal objectives or ranges. Note that the scale of the vertical axis is variable.





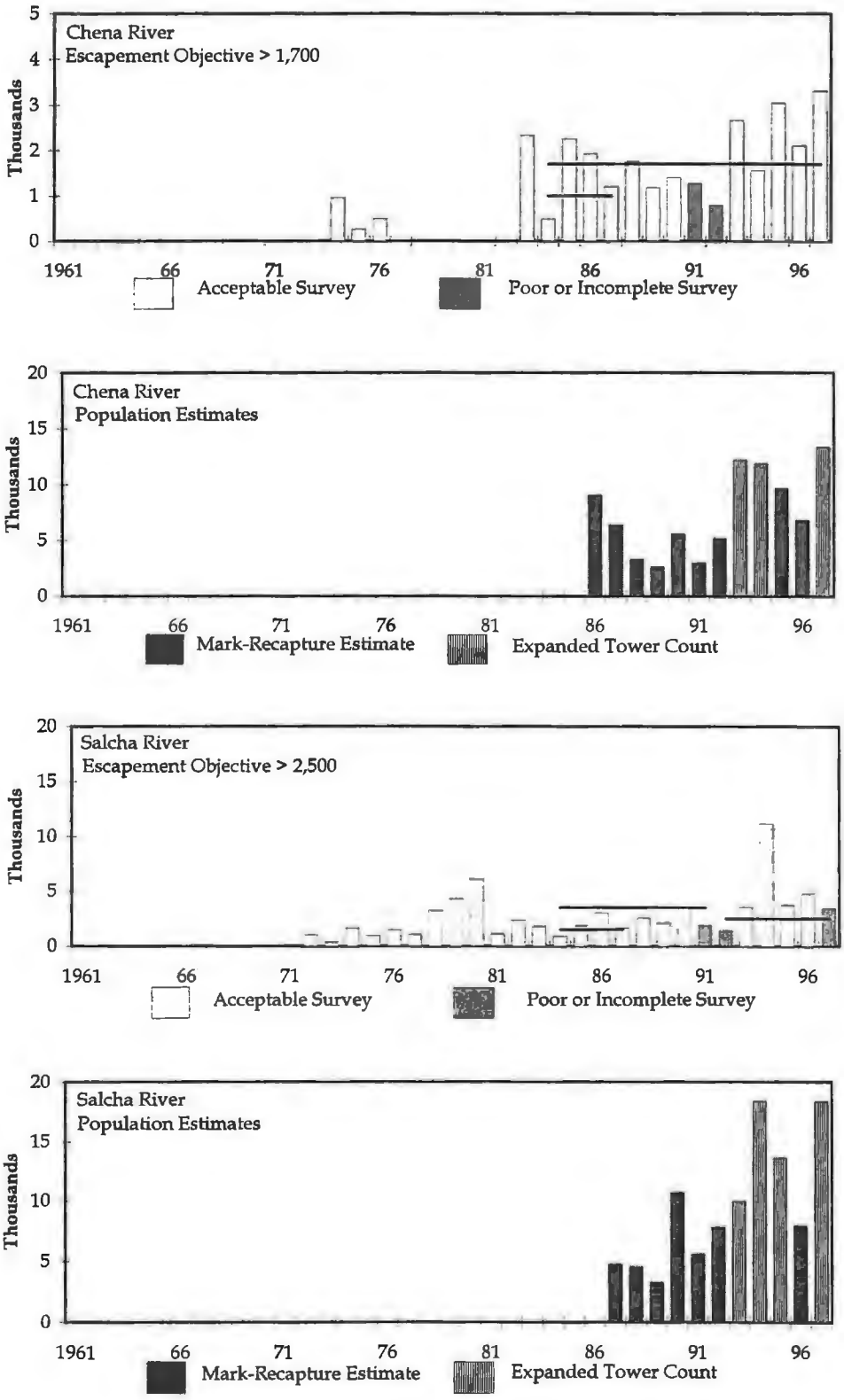


Attachment Figure 10 (page 2 of 4).

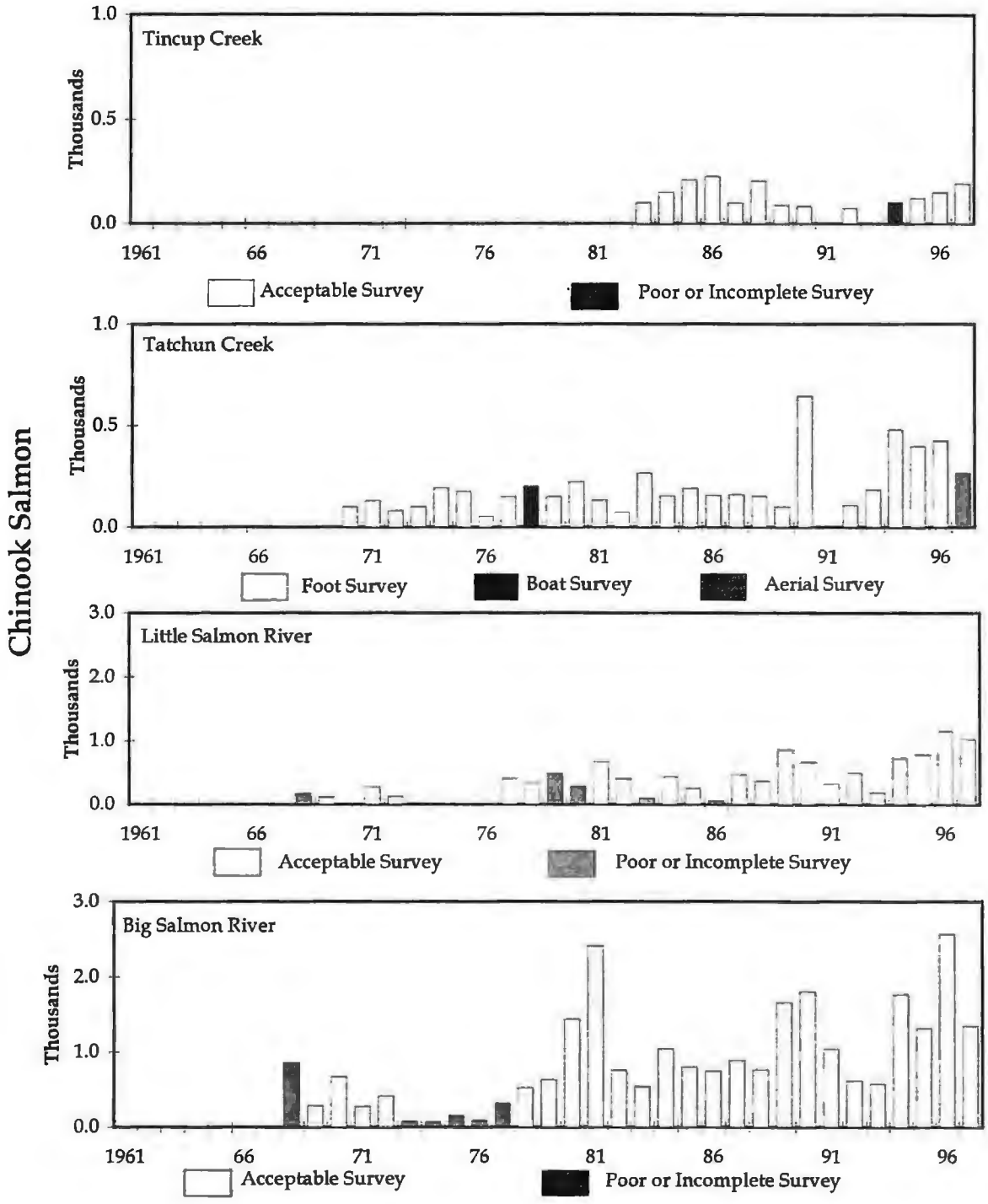


Attachment Figure 10 (page 3 of 4).

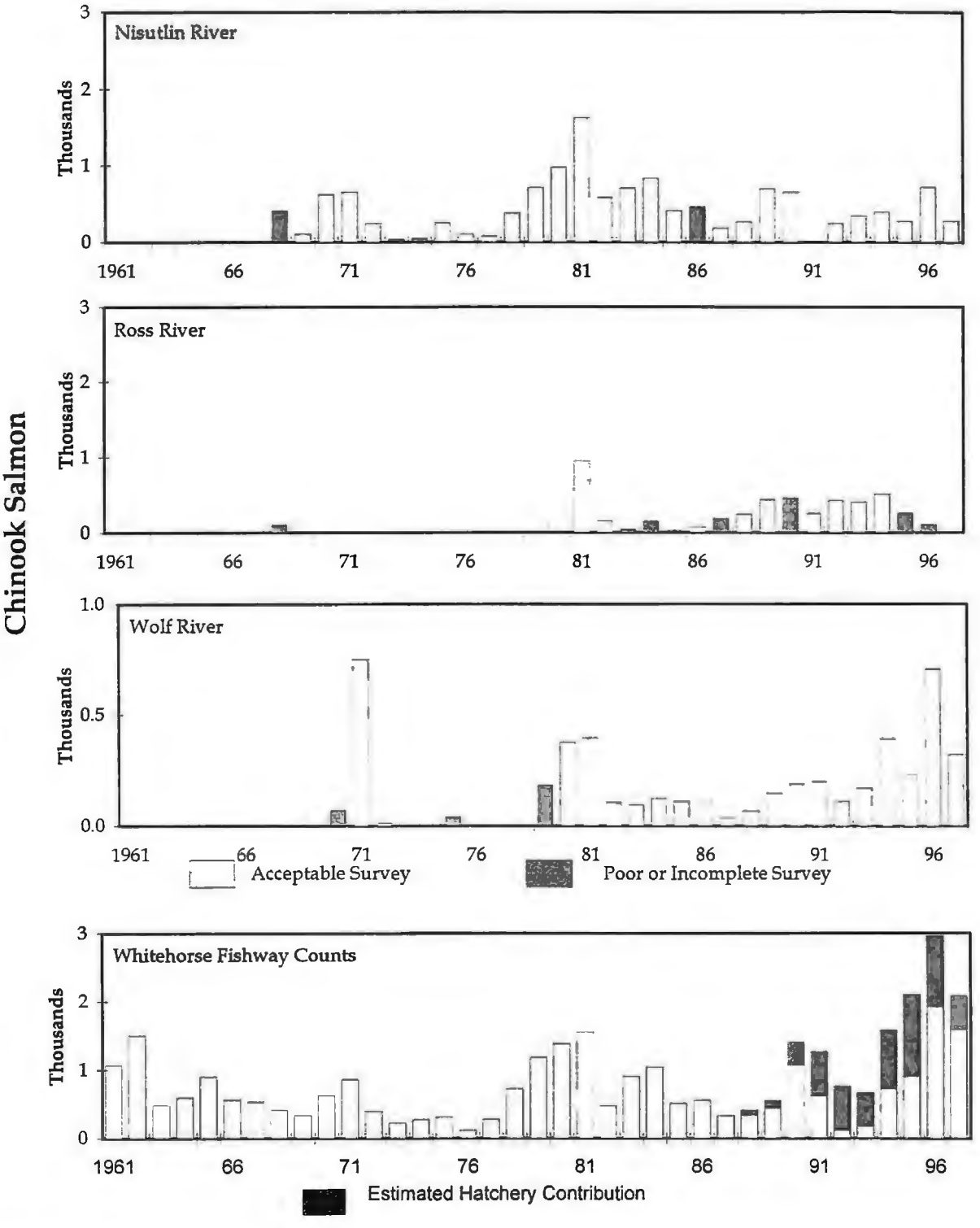
Chinook Salmon



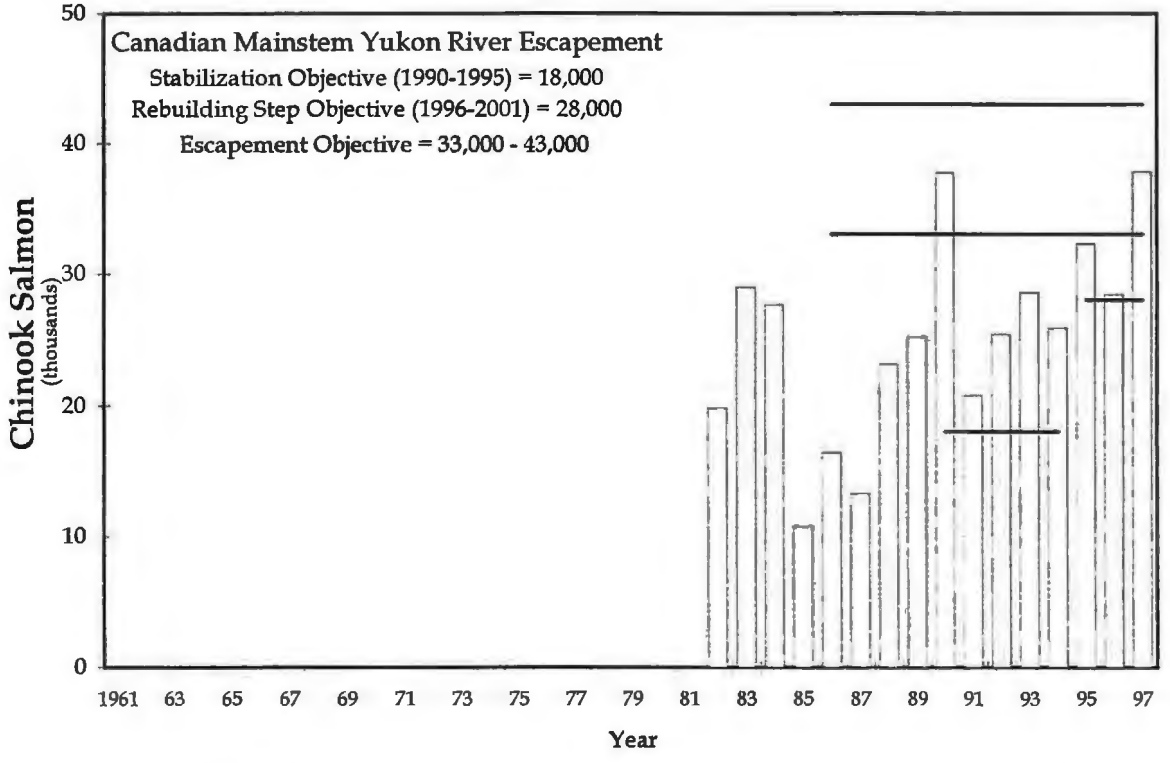
Attachment Figure 10 (page 4 of 4).



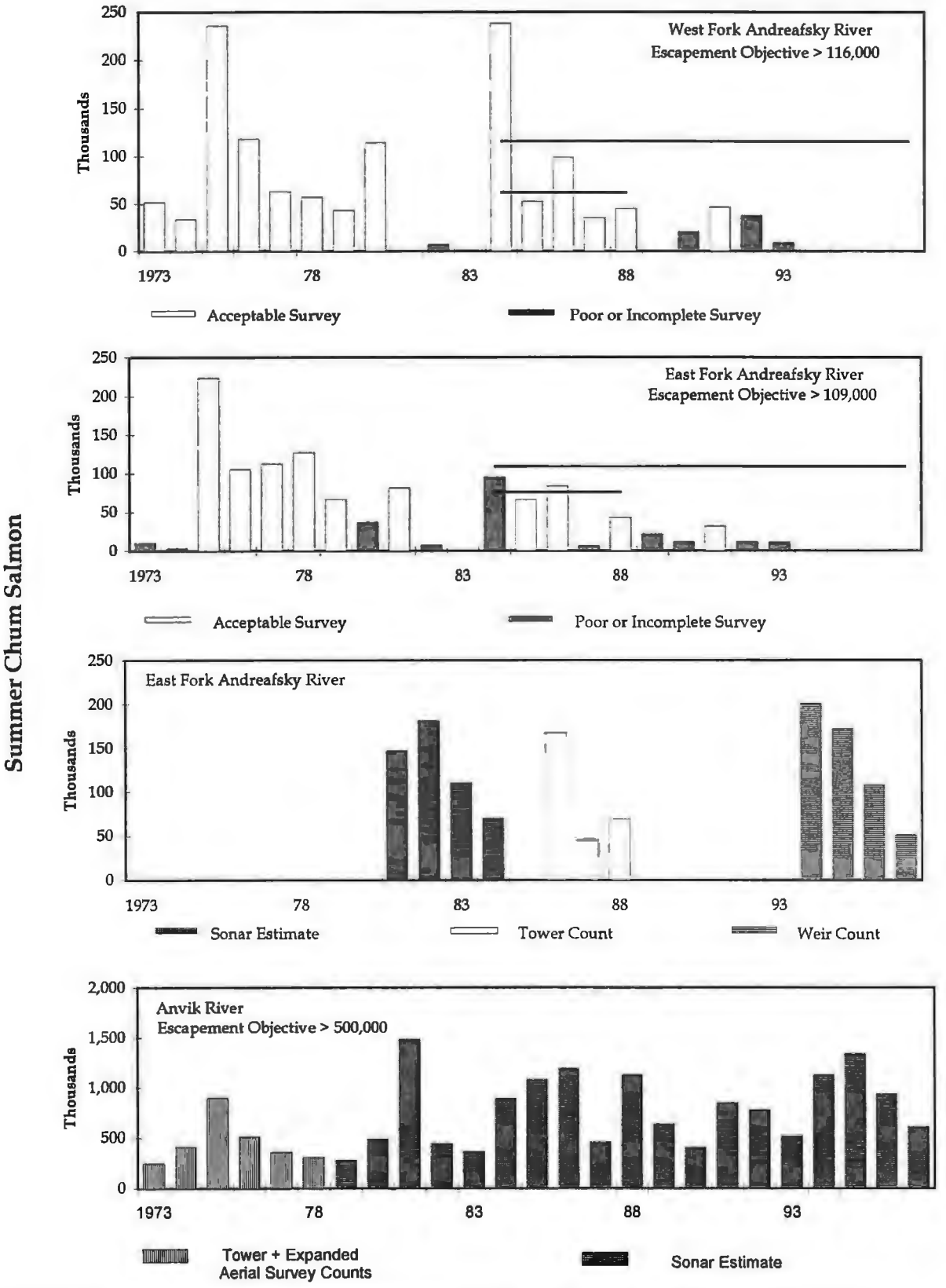
Attachment Figure 11. Chinook salmon escapement data for selected spawning areas in the Canadian portion of the Yukon River drainage, 1961-1997. Data are aerial survey observations unless noted otherwise. Note the scale of the vertical axis is variable.



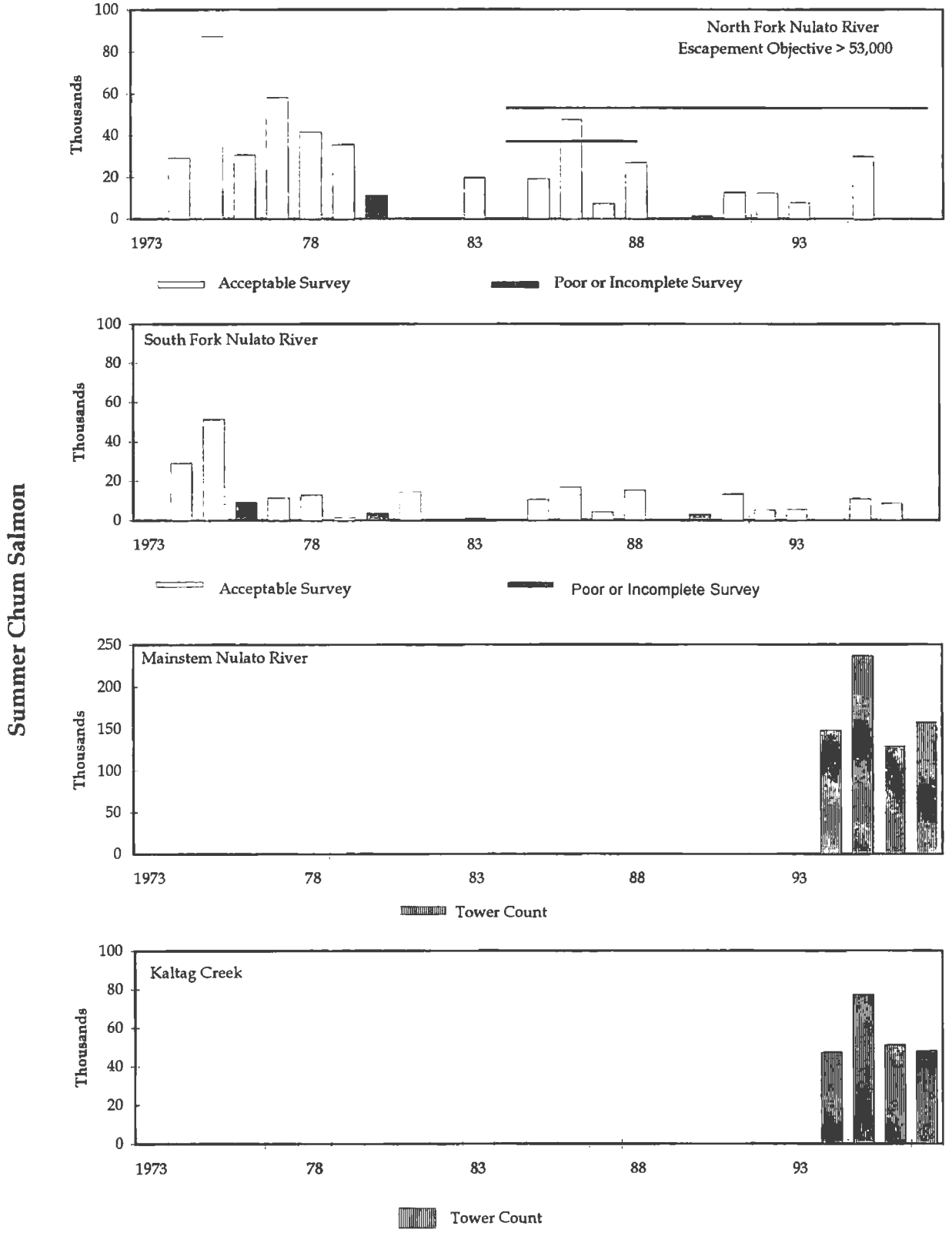
Attachment Figure 11 (page 2 of 2).



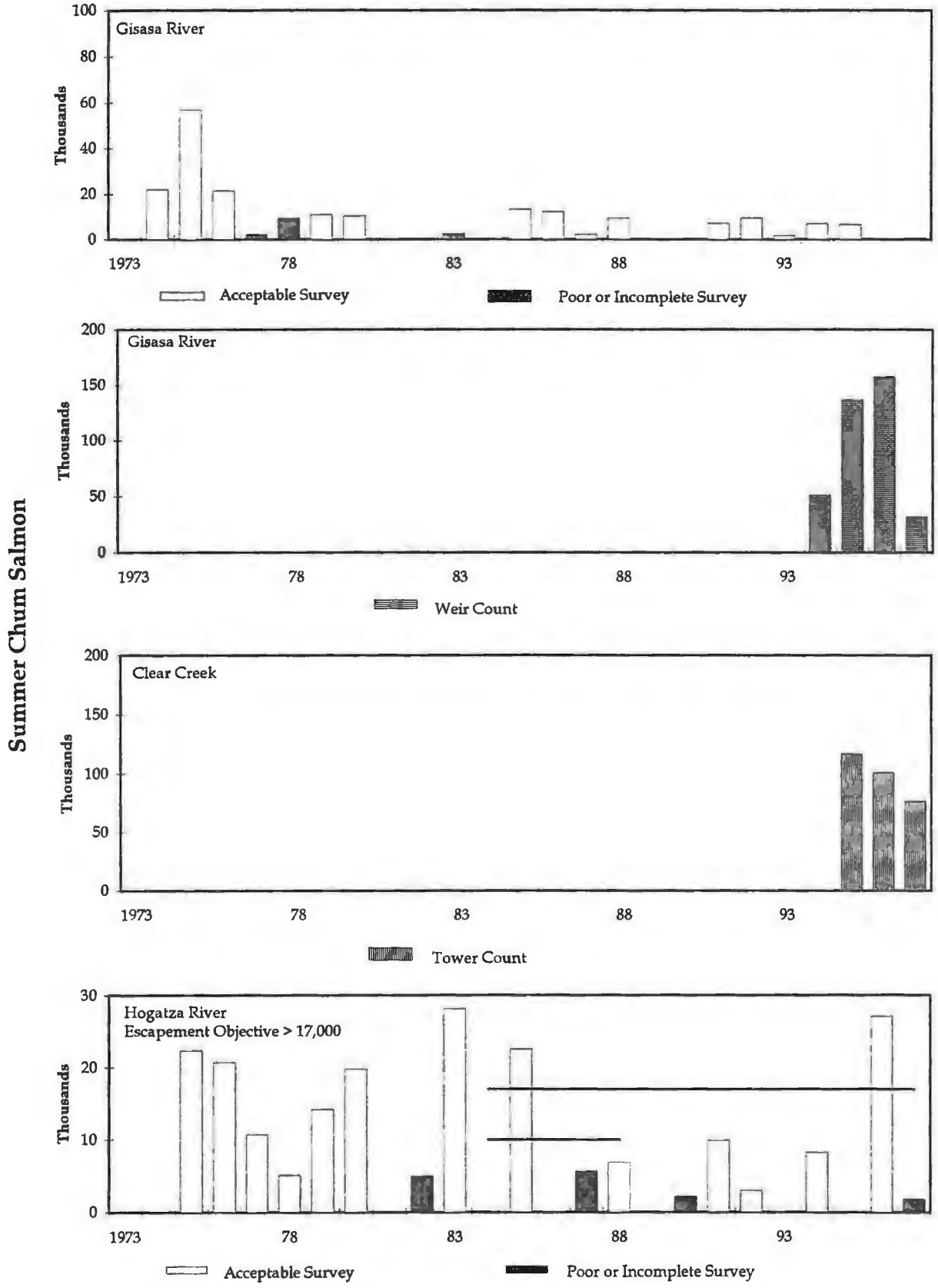
Attachment Figure 12. Estimated total chinook salmon escapement to the Canadian portion of the mainstem Yukon River, 1982-1995. Horizontal lines represent the interim escapement goal range of 33,000-43,000 salmon, the stabilization objective of 18,000 salmon, and the rebuilding step objective of 28,000 salmon.



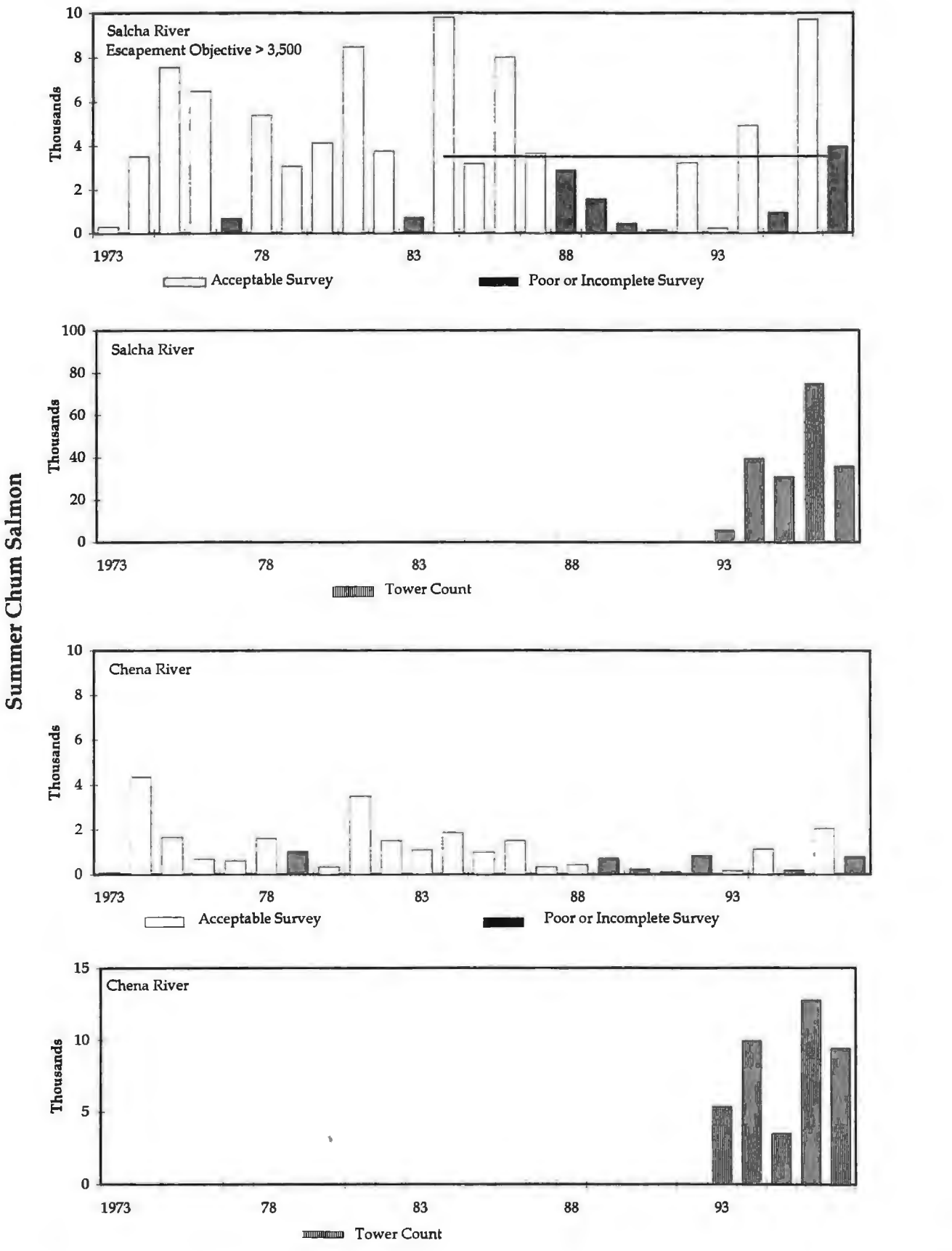
Attachment Figure 13. Summer chum salmon escapement data for selected spawning areas in the Yukon River drainage, 1973-1997. Horizontal lines represent interim escapement goal objectives or ranges. Data are aerial survey observations unless noted otherwise. Note that the scale of the vertical axis is variable.



Attachment Figure 13 (page 2 of 4).



Attachment Figure 13 (page 3 of 4).



Attachment Figure 13 (page 4 of 4).

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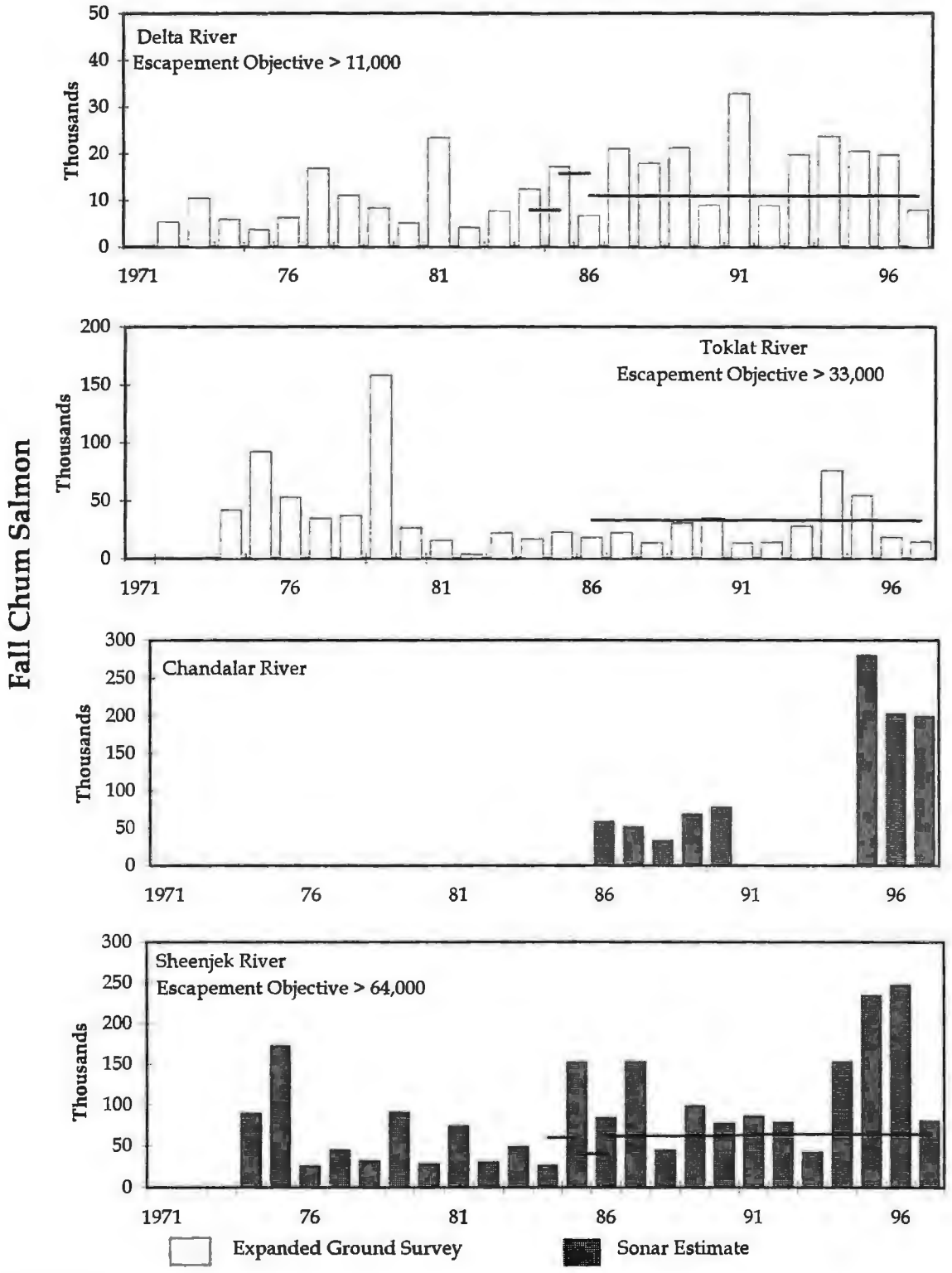
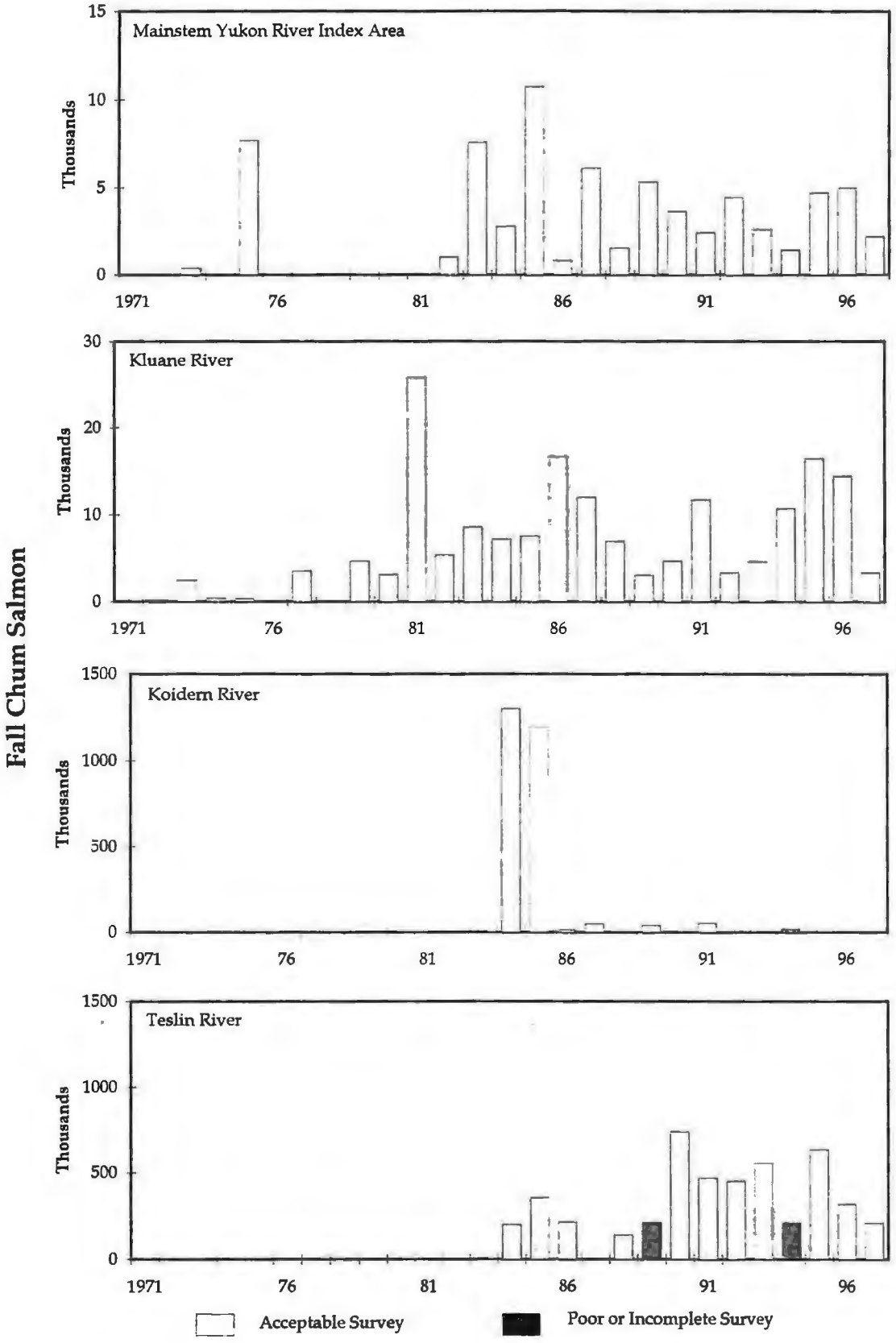
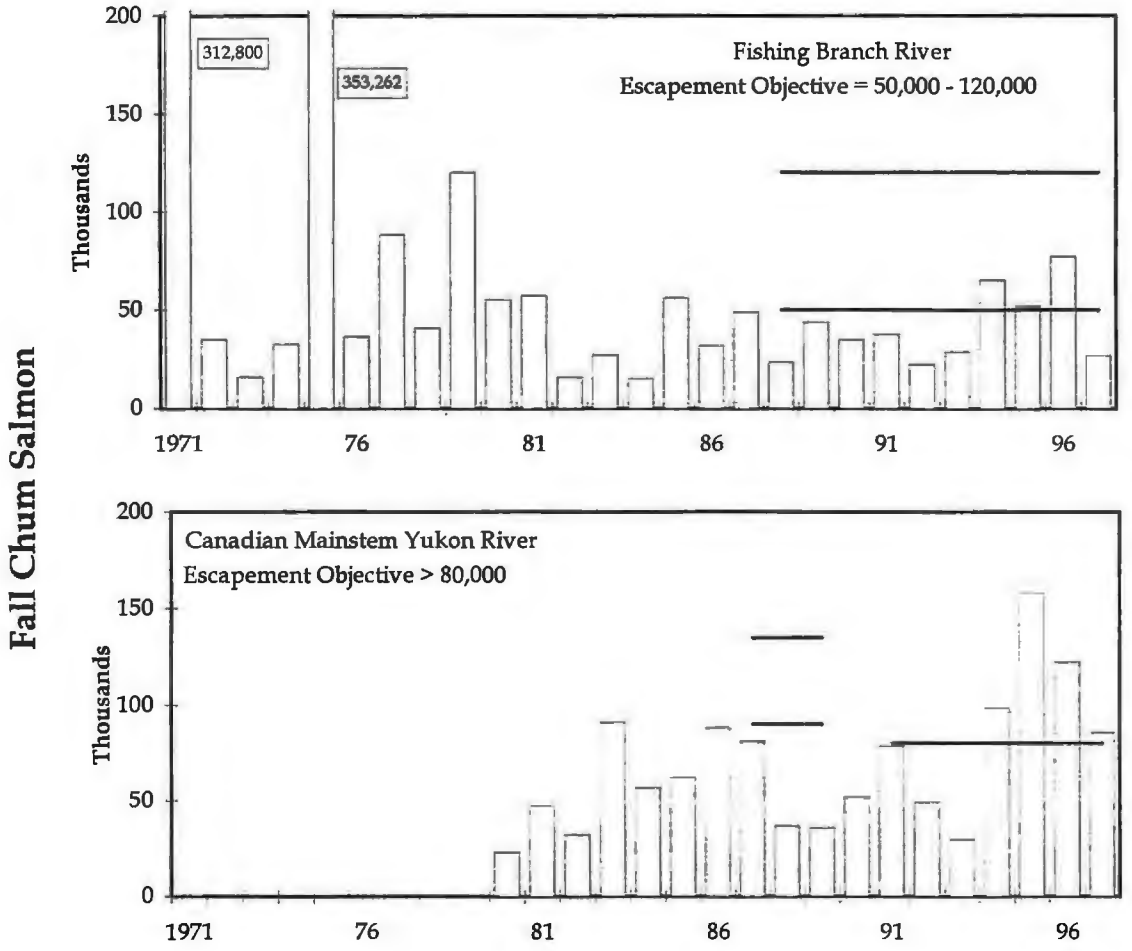


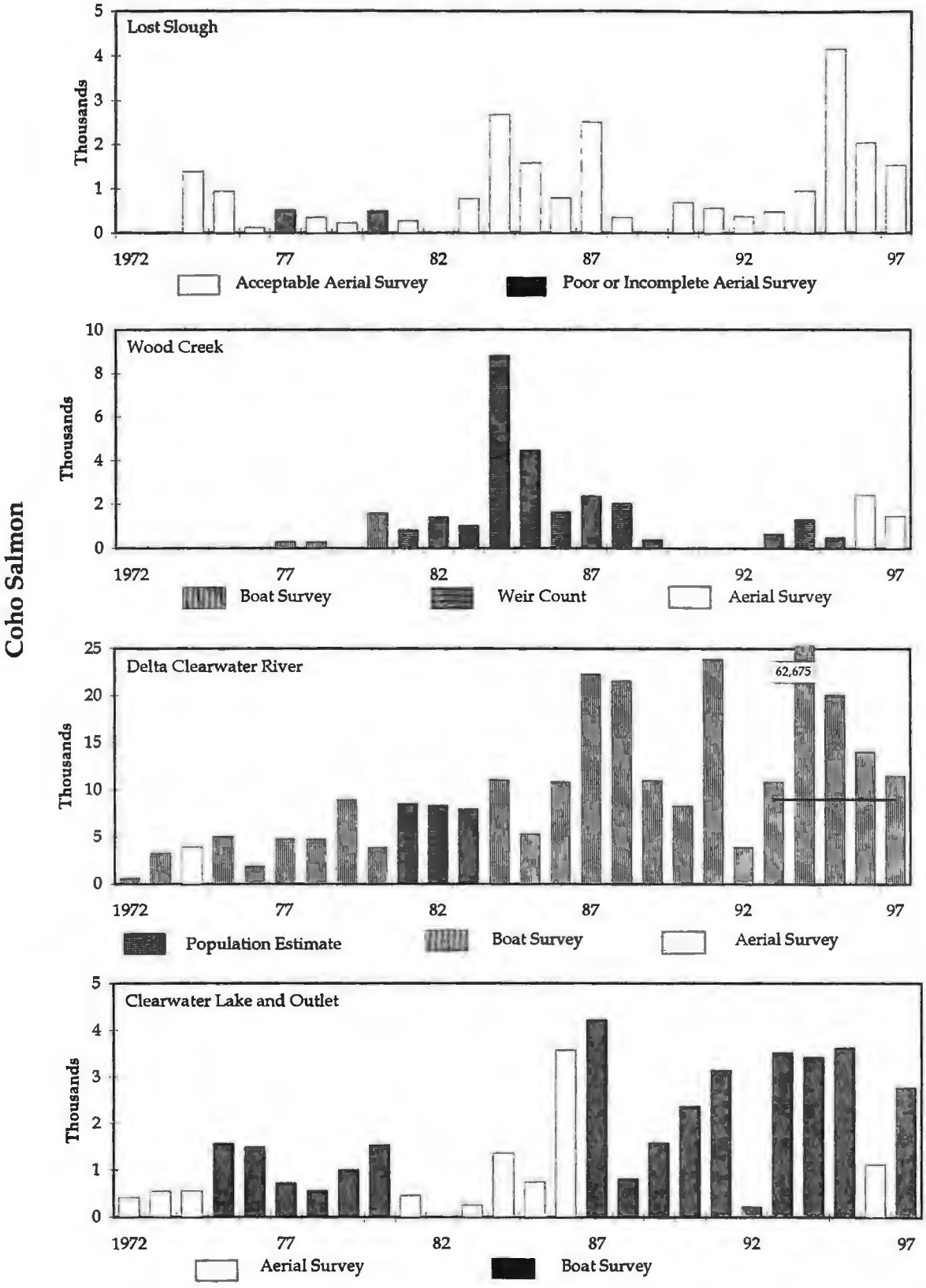
Attachment Figure 14. Fall chum salmon escapement estimates for selected spawning areas in the Alaskan portion of the Yukon River drainage, 1971-1997. Horizontal lines represent interim escapement goal objectives or ranges. Note that the scale of the vertical axis is variable.



Attachment Figure 15. Fall chum aerial survey data for selected spawning areas in the Canadian portion of the Yukon River drainage, 1971-1997. Note that the scale of the vertical axis is variable.



Attachment Figure 16. Fall chum salmon escapement estimates for spawning areas in the Canadian portion of the Yukon River drainage, 1971-1997. Horizontal lines represent interim escapement goal objectives or ranges.



Attachment Figure 17. Coho salmon escapement data for selected spawning areas in the Yukon River drainage, 1972-1997. Horizontal line indicates the interim escapement goal. Note that the scale of the vertical axis is variable.

ATTACHMENT II

MATERIALS PERTAINING TO THE
RESTORATION AND ENHANCEMENT FUND

YUKON RIVER RESTORATION AND ENHANCEMENT FUND
PROPOSAL
TECHNICAL REVIEW FORM

Proposal #_____ Title:_____

_____

_____

Fish Stock or Sub-basin: _____

Part 1. Interim Agreement Criteria

The JTC R&E Subcommittee will be reviewing this proposal for its consistency with the priorities set forth in the Interim Agreement.

Part 2. Technical Review

Rate the following on scale of 1 - 5 with 1 being poor and 5 being excellent.

1. What is the likelihood of the stated objectives being achieved?

   1 2 3 4 5

   Comments:

2. Is the methodology sound? Assess by the following:

   a. Study design 1 2 3 4 5

   b. Statistical design 1 2 3 4 5

   c. Logistical design 1 2 3 4 5

   Comments:

3. Are the personnel and budget proportionate to the stated goals and objectives?

a. Personnel	1	2	3	4	5
b. Budget	1	2	3	4	5

Comments:

4. How well does the proposal provide for:

a. Gathering necessary data	1	2	3	4	5
b. Project analysis	1	2	3	4	5
c. Reporting	1	2	3	4	5

Comments:

Part 3. Effects Rate the following with -5 being the greatest negative effect, and +5 being the greatest positive effect.

1. The following should be evaluated to reflect the potential effects of the proposal **component** (i.e. project) for which funding is being sought.

a. Could the proposal effect existing wild salmon stocks and habitats?

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Comments:

b. Could there be fishery management effects associated with this proposal?

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Comments:

c. Could there there be habitat management effects asscociated with this proposal?

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Comments:

2. The following should be evaluated to reflect the potential effects of the proposal **concept** for which the current work is intended to lead to.

a. Could the proposal effect existing wild salmon stocks and habitats?

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Comments:

b. Could there be fishery management effects associated with this proposal?

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Comments:

c. Could there there be habitat management effects asscociated with this proposal?

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Comments:

Part 4. Risks

1. The following should be evaluated with respect to applicability, low, medium or high risk. This assessment is for the proposal **component** for which funding is being sought in this proposal. (circle one).

a.	Ecological risks	n/a	low	medium	high
b.	Disease risks	n/a	low	medium	high
c.	Genetic risks	n/a	low	medium	high

Comments (identify specific risk):

2. The following should be evaluated with respect to applicability, low, medium or high risk for the overall proposed **concept** (circle one).

a.	Ecological risks	n/a	low	medium	high
b.	Disease risks	n/a	low	medium	high
c.	Genetic risks	n/a	low	medium	high

Comments (identify specific risk):

Part 5. Other information Although this information is not a component of the technical review, the information may be used by the Yukon Panel members in their deliberations.

1. Potential ability of applicant to conduct the project

2. Potential positive and negative socioeconomic effects

3. Potential alternative actions (including, but not limited to, fishery management actions)

4. Educational or public involvement component

5. Additional technical referral/consultation required. If so, list

6. Has the proposal addressed other government, first Nation, ANCSA, consultation?

7. Does the proposal adequately describe the required government permits (as per part B of the application). If not, explain.

8. Do the objectives of this proposal compliment or conflict with any other previous, existing or proposed projects? Describe.

Part 6. Reviewer evaluation summary of proposal strengths and/or weaknesses.

YUKON RIVER RESTORATION AND ENHANCEMENT FUND PROPOSAL
R&E SUBCOMMITTEE TECHNICAL REVIEW FORM

Proposal # Title:

Fish Stock or Sub-basin:

Project Summary:

JTC Technical Recommendation:

Proposal funding is for a new/continuation of an existing project.

Part 1. Interim Agreement Criteria

This proposal is for:

	Assessment	Literature review	Implement	Monitoring	Other
Restoring habitat or wild stocks					
Enhancing habitat					
Enhancing wild stocks					
Other (specify)					

1. Sub-basin priority (circle one) low/medium/high/unknown

2. Is the recommended stocking consistent with expected natural habitat capacity of any of the subject waters? (circle one) yes/no/not applicable

3. Is this proposal consistent with existing Yukon River basin wide stock rebuilding and restoration salmon plan? (circle one) yes/no/not applicable

4. How well do the proposal objectives meet the R&E Fund objectives and criteria?

1 2 3 4 5

Part 2. Technical Review Rate the following on scale of 1 - 5 with 1 being poor and 5 being excellent.

1. What is the likelihood of the stated objectives being achieved?

   1 2 3 4 5

   Comments:

2. Is the methodology sound? Assess by the following:
   a. Study design 1 2 3 4 5

   b. Statistical design 1 2 3 4 5

   c. Logistical design 1 2 3 4 5

   Comments:

3. Are the personnel and budget proportionate to the stated goals and objectives?
   a. Personnel 1 2 3 4 5

   b. Budget 1 2 3 4 5

   Comments:

4. How well does the proposal provide for:
   a. Gathering necessary data 1 2 3 4 5

   b. Project analysis 1 2 3 4 5

   c. Reporting 1 2 3 4 5

   Comments:

Part 3. Effects Rate the following with -5 being the greatest negative effect, and +5 being the greatest positive effect.

1. The following should be evaluated to reflect the potential effects of the proposal **component** (i.e. project) for which funding is being sought.

a. Could the proposal effect existing wild salmon stocks and habitats?
-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5
Comments:

b. Could there be fishery management effects associated with this proposal?
-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5
Comments:

c. Could there there be habitat management effects asscociated with this proposal?
-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5
Comments:

2. The following should be evaluated to reflect the potential effects of the proposal **concept** for which the current work is intended to lead to.

a. Could the proposal effect existing wild salmon stocks and habitats?
-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5
Comments:

b. Could there be fishery management effects associated with this proposal?

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Comments:

c. Could there there be habitat management effects asscociated with this proposal?

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Comments:

Part 4. Risks

1. The following should be evaluated with respect to applicability, low, medium or high risk. This assessment is for the proposal **component** for which funding is being sought in this proposal. (circle one).

a.	Ecological risks	n/a	low	medium	high
b.	Disease risks	n/a	low	medium	high
c.	Genetic risks	n/a	low	medium	high

Comments (identify specific risk):

2. The following should be evaluated with respect to applicability, low, medium or high risk for the overall proposed **concept** (circle one).

a.	Ecological risks	n/a	low	medium	high
b.	Disease risks	n/a	low	medium	high
c.	Genetic risks	n/a	low	medium	high

Comments (identify specific risk):

Part 5. Other information Although this information is not a component of the technical review, the information may be used by the Yukon Panel members in their deliberations.

1. Potential ability of applicant to conduct the project

2. Potential positive and negative socioeconomic effects

3. Potential alternative actions (including, but not limited to, fishery management actions)

4. Educational or public involvement component

5. Additional technical referral/consultation required. If so, list.

6. Has the proposal addressed other government, first Nation, ANCSA, consultation?

7. Does the proposal adequately describe the required government permits (as per part B of the

application). If not, explain.

8. Do the objectives of this proposal compliment or conflict with any other previous, existing or proposed projects? Describe.

Part 6. Reviewer evaluation summary of proposal strengths and/or weaknesses.

PROPOSED REVIEW SCHEDULE

Activity	*Formal notice and call for proposals*	Proposal Deadline for Panel co-chair and secretariat receipt of proposals.	Proposals provided to JTC	JTC review by subcommittee designees and experts	Compilation	Public review and comment Suggest 30 days	Compile information and send panel members proposals, JTC review, and public comments.	Spring Panel meeting to decide which proposals to fund.	Proposal applicant notification of funding
Annual Timeframe	*April 15 to May 15*	September 30	October 15	October 16 to January 10	4 Days	January 15 to February 15	February 16 to March 12	March 13 & 14	April 1
Timeframe 1997-98	*June 28 U.S. July 22 Can*	September 30	November 3	November 4 to February 9	4 Days	February 15 to March 8	February 14 March 8	March 9-13	Beginning March 16
Activity Performed by	*Secretariat*	Applicants & Panel Co-Chairs	Secretariat	JTC & Technical Experts	Secretariat	Secretariat & Public	Secretariat	Panel	Secretariat
Notes	*Suggest uniform content and time distribution.* *Informal opening 1-Jan but the formal notice to occur after the spring Panel meeting.*	Secretariat could return inappropriate proposals or request more information for incomplete proposals before JTC receipt	Present plan is to return incomplete or inappropriate proposals to Panel Co-Chairs *Suggest proposals also go to Panel members for their information.*	JTC finalize proposal review Subcommittee meeting early November to decide on proposal distribution for review. Meet again in early February to finalize review comments.		Timelines and the definition of "public review" to be determined by the Panel.	Panel homework.		This might be pushed to April 15 but applicants need lead time for projects, especially if specialized equipment needs to be manufactured or ordered.